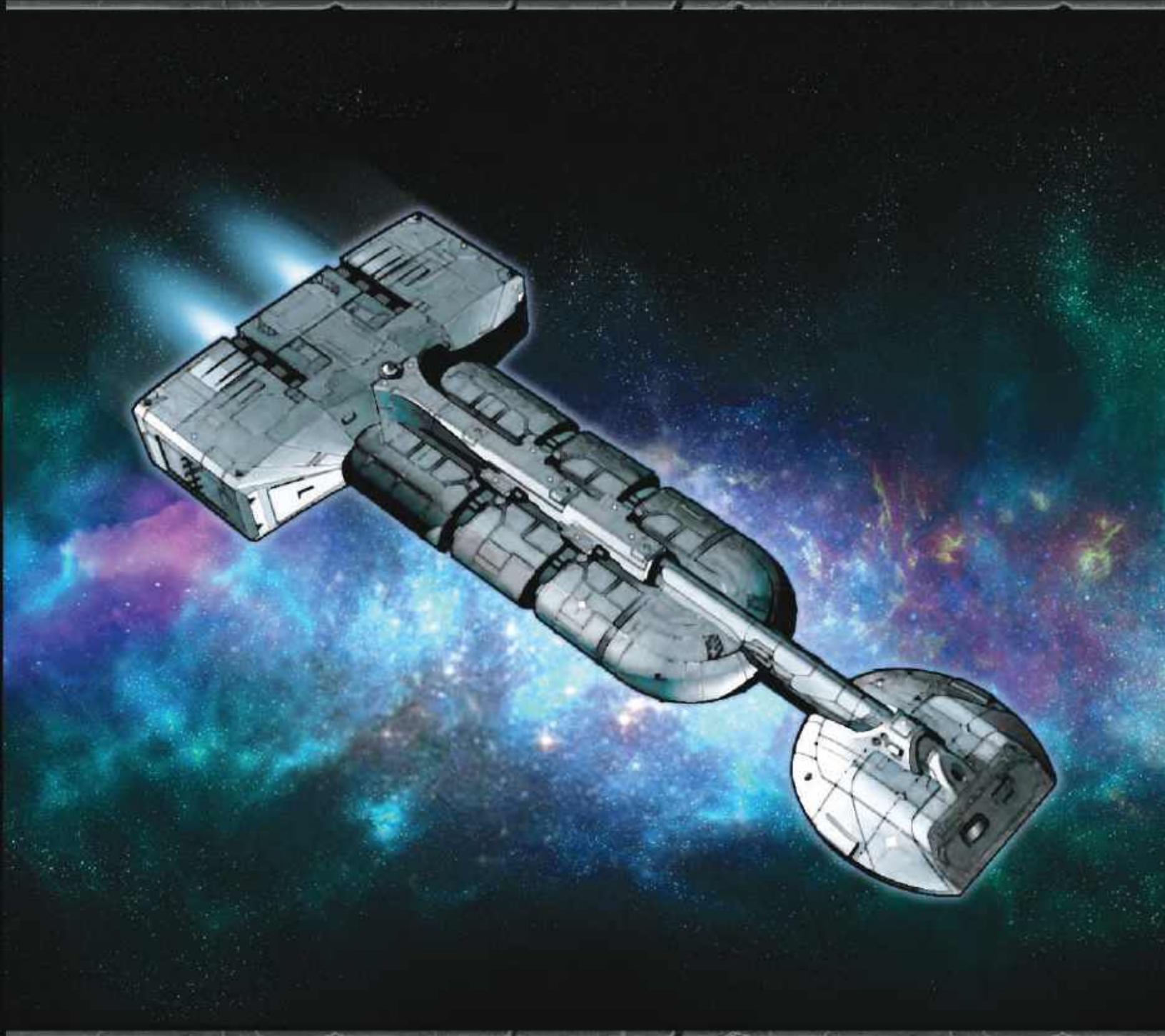
TRAVELLER

REFEREE'S HANDBOOK



SCIENCE FICTION ADVENTURE IN THE FAR FUTURE

TRAVELLER

REFEREE'S HANDBOOK

CREDITS

CLASSIC TRAVELLER
Marc Miller

Loren Wiseman, John Harshman, Frank Chadwick, Darryl Hany, Winston Hamilton, Tony Svajlenka, Scott Renner, Doug Poe, David MacDonald, Wayne Roth, Paul R. Banner, Jennell Jaquays.

MONGOOSE TRAVELLER

Author
Martin J. Dougherty

Editor
Matthew Sprange

Layout and Graphic Design
Sandrine Thirache

Cover Illustration
Cassie Gregory

Interior Illustrations
Sandrine Thirache, Maia Anderson, Cassie Gregory, Michael Leonard, Quentin Soubrouillard, Andoni Fernandez

TRAVELLER INNER CIRCLE
Andrew James Alan Welty, Colin Dunn, M. J. Dougherty, Rob Eaglestone, Sam Wissa, Joshua Bell, Maksim Smelchak

Special Thanks
Marc Miller, Loren Wiseman

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T R A V E L L E R

INTRODUCTION

The *Referee's Handbook* provides the Referee with all the resources necessary to run the campaign. The same system can be used for other long-term missions, whether they are exploratory, scientific, military or something entirely different. These rules draw on concepts and mechanics introduced in the *Naval Campaign Sourcebook* from the *Element Cruisers* box set and *Great Rift Deep Space Exploration Handbook* from *The Great Rift* box set, however all necessary elements are included here.

The mission in *Deepnight Revelation* has a specific goal; to reach a location at the mouth of the Great Rift and investigate what lies there. However, there are numerous reasons why the Travellers will need to explore the space they pass through on the way. The most basic of these is to find a way forward and it will be necessary to resupply the ship and crew at intervals. This requires locating suitable resources and obtaining them using the equipment available. The expedition's backers also expect more than basic stellar classification data on the systems the Travellers pass through and the Travellers themselves might be interested in research. After all, it is highly unlikely anyone will be passing this way again for a long time, so the opportunity must be taken to learn as much as possible.

Some actions simply *must* be undertaken during the voyage. Refuelling is a constant necessity, along with maintenance and replenishment of spares and supplies. It is not practical to expect the ship and its systems to continue to function throughout the whole mission without developing faults. These must be repaired using the ship's own resources or done without. The crew also must be preserved. There are no personnel replacements available; losses must be covered by the rest of the crew and care must be taken to maintain morale.

All these considerations make the journey far more difficult than a course plotted across the local star systems, followed by a series of jumps. The same considerations will force the Travellers to interact with aliens and explore star systems they might otherwise have bypassed, so the needs of personnel and resource management can also lead to adventures.

For a voyage like this one it is necessary to keep track of important materials but these are for the most part abstracted; whether the Travellers need food for a crew banquet or steel for a repair, this is represented by Supply Units (SU). More unusual materials are also abstracted to avoid the game bogging down into endless accounting of how much Amanis Extract has been used up and whether Imbar Powder can be used instead. Referees who want a greater level of detail are welcome to create one but the supply and materials rules in this book are intended to create needs, and thus adventures, rather than to inhibit the voyage.

THE CAMPAIGN

Deepnight Revelation could be run as an episodic adventuring campaign by assuming the ship travels at a steady pace and presenting adventures where they are encountered. Such adventures can be self-contained and resolved using the standard *Traveller* rules. However, the nature of this campaign is such that the voyage is a constant adventure and treating it in an episodic fashion bypasses many opportunities.

A campaign of this scale – in terms of time as well as the size of the crew – would be difficult to handle if all tasks had to be resolved using the standard rules. Instead, a system for handling whole-crew and detachment actions is presented, along with guidelines on how to break the voyage down into manageable chunks whilst still leaving room for unexpected adventures.

The Travellers' goal is to reach the end point of the voyage and investigate the Deepnight Entity. Just getting there is an enormous undertaking. No ship could carry enough provisions or spares to make the journey unaided, so it will be necessary to forage along the way. This, and a desire to learn as much as possible about the regions passed through, will lead the Travellers to alien worlds where grave dangers await. Even if they decide to pass up opportunities to expand their knowledge the Travellers will need to obtain food at habitable planets and seek rare materials to manufacture spares for their ship. They will need to halt for time-to-time to undertake repairs and maintenance, and rest their weary crew. Any one of these stopovers could become an adventure.

For the climax of the campaign to have its full impact the Travellers need to appreciate just how far they have come and recall the dangers they have braved to get there. The Referee and Travellers should therefore savour the journey to the mouth of the Great Rift. After all, it is one of the most incredible journeys ever undertaken!

What You Will Need to Track

Over the course of the campaign the Referee (or the Travellers if the task can be delegated) will need to track certain variables, which will influence the course of the mission. These are:

Crew Complement of *Deepnight Revelation* – in order to determine whether casualties have affected efficiency.
Efficiency Indicators – the Crew Efficiency Indicator, Crew Efficiency Indicator Modifier and Detachment Efficiency Indicators for the four Divisions of the crew. These are explained on page 30.
Morale – the morale of the crew has implications for the storyline as well as the progress of the mission.
Supplies and Special Materials – supply levels will be a real issue for the Travellers, perhaps forcing them to take actions they would rather have avoided.
Small Craft and Vehicles – these are effectively irreplaceable and a lost ATV or pinnace could have serious repercussions later in the mission.

CHAPTER ONE

KEY CONCEPTS

A colossal campaign like *Deepnight Revelation* could require an enormous amount of record-keeping on the part of the Referee, the Travellers or both. On the other hand, the challenges of managing a large ship and crew must be sufficiently great that the Travellers gain a sense of achievement when they carry off a well-coordinated mission. The supply and fuel needs of the ship will also drive many of the adventures the Travellers encounter along the way.

The most critical element of the mission is the crew of *Deepnight Revelation.* Their initiative and problem-solving ability is far more important than any piece of equipment. However, with a crew numbering in the hundreds it is not feasible to keep track of individual skills levels, nor desirable. Instead, an abstract resolution system is used, which determines the outcome of a group effort.

This is the basic concept for Refereeing a campaign like *Deepnight Revelation*:

Adventures use skill checks for individuals; large-scale endeavours use abstract resolution.

The Referee may use the abstract system at any time it seems desirable, or may play out a situation as an Adventure and make individual skill checks. There is no hard-and-fast rule for what has to be an Adventure and what should be abstracted but overall anything the Travellers are directly involved in has the potential to be an Adventure. However, it is important to note that the DMs created by the abstract resolution system do not equate directly to skill levels. Resolving a whole-crew action with a skill check by a single Traveller will lead to inappropriate results.

Note that the abstract resolution system assumes the ship's equipment is available. There is no bonus to an abstract large-scale resolution for specialist equipment but any checks made by Travellers or individual crewmembers during an Adventure *will* benefit from advanced or specialist equipment.

LARGE-SCALE RESOLUTION

Deepnight Revelation uses an abstract resolution system to deal with large-scale actions by the crew or a significant segment of it, allowing the Referee to quickly generate results to routine actions and determine if anything unusual happens. The system is used for most routine tasks and to determine the outcome of situations where the Travellers are not present. With a large ship and crew it is often necessary to know how well the repair work went but resolving every action with checks on the part of crewmembers would take too long. On the other hand, the simplest task can go awry and require urgent action by the Travellers. The abstract resolution system presented here allows a balance between 'big-picture' resolution of situations and sufficient detail to remain interesting.

The key to this system is to break complex situations down into parts that can be resolved without undue difficulty.

The trip from Charted Space to the mouth of the Great Rift is referred to as the **Voyage**, which is subdivided into many component parts. A **Reach** is a component of the Voyage, typically a passage through several star systems, which may include other activities such as exploration, refuelling or fighting a horde of hostile aliens.

Each significant task undertaken or situation encountered by the ship and her crew is termed a **Mission**. Some Missions are routine, such as conducting a gas-giant refuelling, whilst others have greater significance. Examples of the latter include making contact with an alien species or investigating a strange artefact. The ship might have several Missions ongoing at once. For example, a team might be sent in a shuttle to land on and survey a nearby moon, whilst the parent vessel is refuelling, and at the same time a detachment of the crew might be undertaking a Mission to research an object brought aboard in the last system visited. Each Mission can be separately resolved, although its outcome and events may impact others being undertaken.

Missions are further broken down into **Mission Segments**, which are resolved in logical order to determine the mission outcome. Each Mission Segment can be further subdivided into **Operations**. An Operation is a self-contained task, usually resolved with a single check. Note that none of these is an Adventure but any of them can lead to one.

An **Adventure** is a situation where the Travellers need to make decisions and the focus shifts to a traditional style of play. For example, *Deepnight Revelation* will need to carry out gas-giant refuelling on many occasions during her voyage. Each of these is a Mission but most are resolved in an abstract manner allowing the voyage to progress without becoming bogged down in minutiae. However, on one occasion an unidentified vessel approaches during the operation. This is an Adventure, in which the Travellers shift from big-picture resolution to tight-focus roleplaying.

There are many occasions where a Traveller might personally take over a task or lead a small team to carry it out. It is entirely reasonable to resolve such a task with a check by the Traveller rather than use large-scale resolution but one Traveller – no matter how skilled – cannot replace several workers, nor can a Traveller compress the time taken for those workers to complete the task. So, if a job would take three days for a team of crewmembers, it still takes three days and requires the same number of hands to complete, even if a Traveller takes personal charge.

GENERAL AND VAGUE CHECKS

This campaign contains a number of mysteries and complex situations that may not be exactly as the Travellers initially suppose. There are occasions where the Referee may need to let the Travellers think they have succeeded at a task or discovered all available information where in fact they have missed something important. If there is more to the situation than immediately apparent, success by a greater margin might be necessary.

This can be accomplished using a check that has a hidden component. The Referee tells the Travellers to make a check at the level they think they need but takes note of the Effect of the check. For example, completing a routine security walkaround is an Easy (4+) task for the crew. If the Travellers fail the check, they know they have failed, which may alert them that something is amiss. If they succeed the Travellers may think they are safe but in fact all the check indicates to them is that they have completed a standard security walkaround. If the standard procedure would be unlikely to spot a problem the Referee may require an Effect of 2, 4, 6 or even higher to succeed beyond the expectation.

For example, the Travellers order a standard security walkaround and make a check to see if it is successful. They obtain a result of 7 and are sure the walkaround was properly completed. However, there is an alien monster aboard the ship and an Effect of +4 was required to notice traces of its presence. The complacent Travellers are more vulnerable than they would be if they knew a check had been failed.

This is not 'cheating'. The check was made to successfully complete a security walkaround and spot the things a routine check would find. A high Effect would indicate the walkaround was particularly diligent or there was an obvious clue, giving the Travellers a chance to detect the creature before it attacks without alerting them outside the game environment to the fact something is afoot. If the Travellers had set out to search the ship carefully for signs of intruders, the task difficulty would be based on doing exactly that.

The simple rule for this is:

If the Referee requires a check to accomplish something, the difficulty level should correspond to the specific objective. If the Travellers decide to carry out an action, the check is to determine if they complete it correctly. The results should reflect the likely outcome if they did but do not rule out the possibility of missing something if the check produces a marginal success.

A certain type of Traveller will try to 'game' this system by specifying extremely precise tasks or including all manner of contingencies. A crew expected to carry out these time-consuming and generally fruitless tasks will suffer a morale penalty and may eventually start making false reports of a completed job whilst doing only the minimum required. A compromise must be reached between effectiveness and annoying the crew.

INDEXES

Deepnight Revelation uses a number of Indexes to track important values. These include the efficiency of the crew, the amount of knowledge the Travellers have about a nearby star system and the esteem in which a Traveller is held by his comrades. Each of these Indexes has a standard set of values, allowing the Referee to quickly establish the current situation whilst keeping track of something the Travellers may come back to. For example, the Survey Index for a given star system can be recorded when it is surveyed and if the Travellers later request information the Referee will know how much or how little to give them.

KEY CONCEPTS SUMMARY

The mechanics presented in this book make use of a number of key concepts. Not all are used in every resolution cycle and the Referee may at any time choose to use the core *Traveller* rules instead.

Crew: The entire crew of *Deepnight Revelation*, including the Travellers.

Detachment: A part of the crew. This might be a permanent organisation such as one of the crew Divisions (Flight, Engineering and Operations) or a temporary group sent to carry out a mission. In the latter case the detachment is referred to as a Team.

Crew Efficiency Index (CEI): This is an indicator of the overall ability of a ship and crew, used when abstracting events that affect the ship as a whole. CEI can vary over time but requires major events to alter.

Crew Efficiency Index Modifier (CEIM): This is an indicator of the general state of the crew and whether they are performing above or below their expected level. CEIM varies continually depending on circumstances.

Detachment Efficiency Index (DEI): This is an indicator of the overall ability of a group of crewmembers or Division of a ship's company (such as the Gunnery Division or a damage-control party dispatched to carry out a major repair). It is used when abstracting the results of smaller events.

Morale (MOR): This is an indicator of how content and confident the crew are. A crew with a low MOR will not be steady in action and MOR 0 will likely result in mutiny.

Esteem (EST): Esteem is a measure of how well regarded an individual Traveller is by their crewmates. It can affect reactions of crewmembers to orders and the likelihood of a suggestion being heeded.

Crew Fatigue Index (CFI): Crew Fatigue Index is used to track the degree to which fatigue has degraded the effectiveness of the crew or specific individuals.

Voyage: The entire expedition.

Reach: A section of the overall Voyage with a clear start point and end goal.

Mission: A self-contained set of tasks and orders the crew or a detachment is sent to carry out.

Mission Segment: A subdivision of a Mission, usually focusing on one task or a single location.

Operation: A task carried out by the crew or a detachment of it. There may be several Operations in a Mission Segment.

Adventure: Something unusual that happens during a mission, requiring the focus to shift from abstracted resolution to conventional roleplaying.

CHAPTER TWO

REFEREE'S NOTES

As the Travellers progress with their voyage they will encounter deep space and in-system phenomena, which may challenge their understanding of the universe. In order to recognise something out of the ordinary and comprehend why it is different or dangerous, it is necessary to have a good grasp of what is normal.

STAR SYSTEMS

A star system is a collection of objects orbiting one or more stellar or sub-stellar objects. In this context a stellar object is one that exerts an equivalent gravitational attraction to a star. This may not be an actual star in some cases; it could be a black hole or some other body that has a high gravitational pull. A sub-stellar object is something that exerts smaller gravitational attraction, which is still significant enough for it to be in the 'stellar' rather than 'planetary' class. The commonest sub-stellar objects are brown dwarfs, which can be considered to be nearly-stars. Other objects with a similar gravitational attraction but different physical properties are possible.

A stellar or sub-stellar object may be encountered without any planets or other major bodies orbiting it. This is sometimes termed a 'barren system', although by definition it is not a star system at all. It is unlikely there will be absolutely nothing in the vicinity; the loneliest solo star or brown dwarf may have comets or some planetoids orbiting it. The sparsity of such a system is grounds to consider it empty. Obtaining fuel in a barren system is near-impossible, although an icy comet might be eventually found.

More commonly, a stellar or sub-stellar object will have bodies orbiting it. Most, if not all, will orbit in a narrow plane aligned with the rotation of the system's primary or main star. This orbital disc is known as the ecliptic. Occasionally an orbital path will be inclined at an angle to the ecliptic or even retrograde – orbiting in the opposite direction to other bodies. This is often an indication of a captured body, although in complex or multi-star systems it is possible that some bodies may settle into unusual orbital patterns.

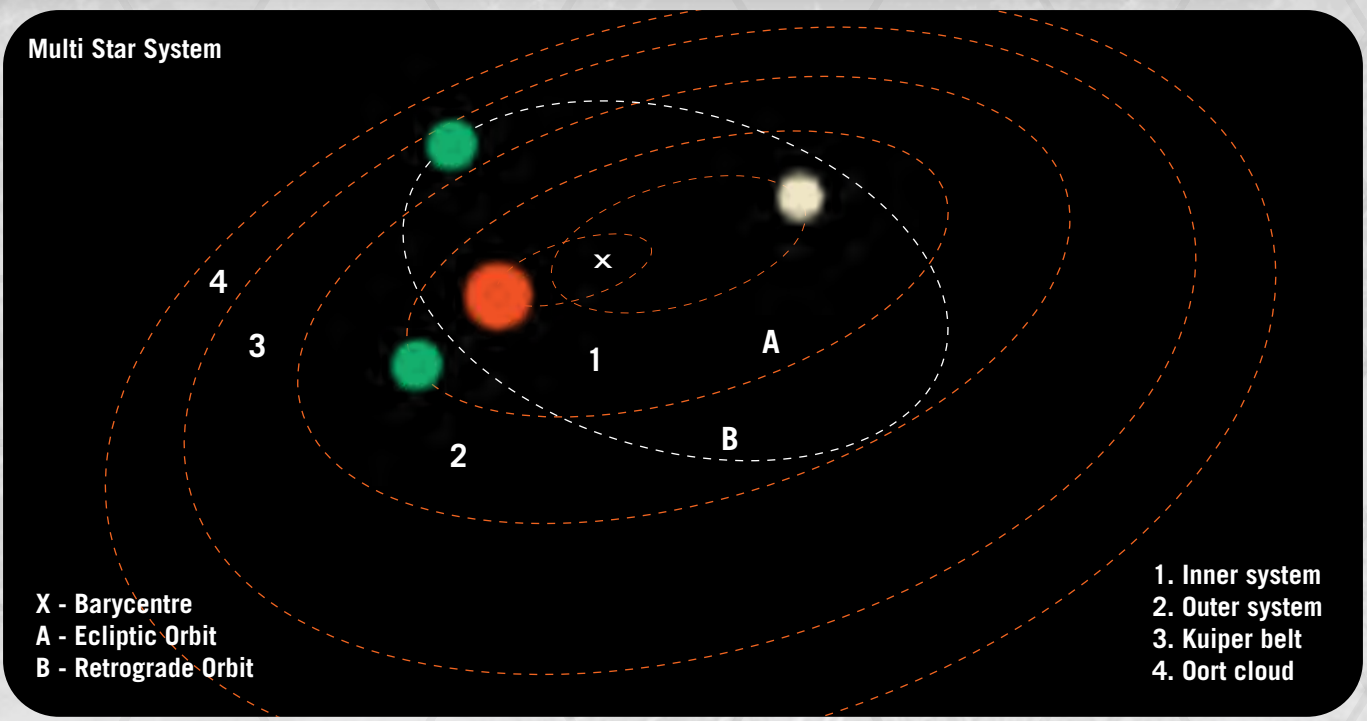
A multi-star system may take the form of a primary and a close or distant companion, or even more than one group of stars. Bodies orbiting a star with a close companion tend to orbit the barycentre of both. This is the point where the combined gravity of both stars is at its maximum. It is rare, but not unknown, for a planetary body to have an orbit that takes it between close companions. Conditions on such a body are likely to be extreme.

It is possible for a distant companion star to have a planetary system of its own, although as a rule there will be a far greater concentration of planets and other bodies orbiting the primary. Very complex multi-star systems can exist, with three or more stars – possibly with close companions of their own – orbiting the barycentre of their gravitational forces. Such a system may have bodies orbiting each star and others orbiting the system's barycentre. Such phenomena are rare and a system with multiple habitable worlds would be a real prize for any starfaring race.

Most planetary objects associated with a star system are found within a relatively small area. The 'inner system' typically extends out to about 2.5AU or so for a main sequence star and is the most likely location for life-bearing planets. The 'outer system' is much larger, extending out to 30AU or more from the primary. Orbits in this region are long and far apart, and two outsystem bodies on opposite sides of the star are separated by huge distances.

Beyond the planetary region is the Kuiper Belt, a disc-shaped region that stretches from 30-50AU out from the star. In most systems the Kuiper Belt contains vast numbers of small rocky and ice bodies. These are dispersed over a wide area but a ship with good sensors should be able to find an icy planetoid to obtain fuel sooner or later. The Kuiper Belt may contain dwarf planets similar to Pluto or Ixion.

Beyond even the Kuiper belt is the Oort Cloud, a spherical region containing comets and small icy bodies. Although in most systems these exist in huge numbers they are small and widely dispersed in a shell reaching from 2,000AU to as far as 100,000AU (1.5 light years) from the typical main-sequence star. Finding an object such as an ice comet for refuelling is far easier in the Oort cloud of a star system than in deep space.



SYSTEM DENSITY

Commercial starship operators tend to think in terms of mainworlds rather than star systems – it is the system's primary port that matters, then economic factors, then other considerations such as whether there are gas giants in the outsystem. Explorers look at the data differently, not least since they must know whether fuel is available before entering a system. Once this is established, physical data is determined first, then other information such as the presence of a population or life on any of the system's planets.

Explorers often need to categorise star systems by their object density and/or potential economic worth. This value is known as the Density Indicator. It is a guideline rather than hard-and-fast rule and can at times be misleading. However, the Density Indicator is generally useful when deciding how to prioritise survey or follow-up missions. The density of a system also indicates the likelihood of finding valuable minerals or ice-bearing comets, which may be of critical importance to explorers or long-distance starship operators.

System Density Indicator is calculated as follows:

At least one gas giant	+3
Per additional gas giant	+1
At least one terrestrial (rocky) planet	+2
Per additional terrestrial planet	+1
At least one planetoid belt	+2
Per additional planetoid belt	+1

System Density

Density Indicator	System Density	Notes
0	Barren	No planetary bodies; possible comets and planetoids
1–3	Extremely Sparse	Single planetary body, which may be captured or a passing rogue
4–6	Very Sparse	D3 planetary bodies
7–9	Sparse	The lower end of typical system density; roll 1D+1 for number of planetary bodies
10–12	Normal	Typical planetary system; roll 2D for number of planetary bodies
13–15	Dense	The upper end of typical system density; roll 2D+3 for number of planetary bodies
16–18	Very Dense	3D planetary bodies
19–21	Extremely Dense	4D planetary bodies
22+	Anomalous	Systems this dense are very rare and worthy of close investigation

A planetary body in this context can be a gas giant, terrestrial (rocky) planet or planetoid belt. Rogue bodies and objects in the process of being captured by or ejected from the system may or may not be considered as part of these totals at the Referee's discretion.

Note that Density Indicator can be applied to a known system or generated as a means to quickly determine what might be present. This is discussed on page 8.

GRAVITATIONAL EFFECTS

Gravity is one of the fundamental forces of the universe and plays an important part in the *Deepnight Revelation* campaign. Gravitational effects are used to plot star systems for navigation and find deep space bodies. Gravity is also what keeps planets orbiting their stars. Gravitational attraction obeys an inverse square law. This means that moving an object twice as far from a gravitational source reduces the force acting upon it to a quarter. An object 10 times as far from gravity source experiences a hundredth of the attraction and so forth.

Thus gravitational effects drop off quickly over distance but they never really disappear. Every object in a star system attracts every other object but for small bodies or those very far away the effect is negligible. The gravitational field of an object can be plotted with advanced instruments and a model built up of how these fields interact. This allows inferences to be made about objects not directly visible or how orbital bodies can be expected to behave. Any deviation from the projected pattern suggests data is missing – or perhaps that a Traveller has made a mistake in their calculations.

The orbital path of any body is determined by its current velocity, mass and the gravitational forces acting upon it. To be stable an orbit must balance these forces, which can result in highly elliptical orbits or complex paths if the object is being acted upon by forces imposed by multiple sources of gravity. An object moving too slowly will spiral in towards the gravity source it orbits; one that moves too quickly will spiral outward. However, changes in distance may be accompanied by acceleration or deceleration, which is how an object can be ejected from a star system. Gaining speed as it spirals in, the object reaches escape velocity and hurtles out of the star system.

The same principle can be used to gain a gravitational assist in manoeuvring a starship or small craft, or in escaping from a gravity well. A ship with 4g of thrust cannot accelerate directly away from a 5g gravitational field; the net force is 1g inward and the ship will accelerate in that direction. However, by using 4g thrust to accelerate the ship it is possible to gain enough speed to escape, accelerating not quite directly towards the body but using its gravitational attraction to provide additional acceleration.

Calculating the optimum path is a tricky business and there are some situations where the ship simply cannot escape with available thrust. This may mean colliding with a planetary surface at high speed, plunging into a gas giant's atmosphere or crossing the event horizon of a black hole. In the case of very high gravitational fields, such as those encountered close to a black hole, there may be additional effects such as time dilation, which very high speeds can also cause. Essentially, this means that although time passes normally for the crew, their craft will appear 'frozen' or to be moving incredibly slowly to an outsider. Conversely, events outside the ship will seem to its occupants to take place at enormous speed. If the craft escapes and the perceived passage of time inside falls back into synch with the outside universe, more time will have passed outside. Time dilation is thus a one-way ticket into the future. This may be a matter of hours or days but in extreme cases a few minutes spent avoiding the event horizon of a black hole might be thousands of years in the outside universe.

GRAVITATIONAL PHENOMENA

Any object with significant mass can be considered a gravitational phenomenon, in that it creates a gravity well and affects the movement of objects around it to at least a tiny degree. A lonely comet in deep space will, more than likely, first be detected as a weak gravitational phenomenon. Additional data will allow its size, reflectivity and other factors to be established, eventually leading to positive identification as a particular type of body such as an ice-bearing comet in the 200 metres radius range.

Major gravitational phenomena are more noticeable and will be detected at great distance by any gravitation-based instrument. The most obvious major gravitational phenomenon is a black hole. Black holes are not objects in the usual sense; they are phenomena caused by compression of matter into an infinitely small space termed a singularity. The 'hole' is in fact a region of such high gravitational attraction that even light cannot escape.

A black hole is formed when a star of sufficient mass collapses, which also causes a supernova. The intense radiation from this event would affect systems for several parsecs; finding a black hole without supernova evidence would be very curious indeed and would challenge the Travellers' understanding of

astrophysics. Such a phenomenon will be encountered near the end of the *Deepnight Revelation* campaign; its strangeness may pique the Travellers' curiosity and also serve as a warning.

Most black holes are of the stellar class, containing 1-40 stellar masses. This means that although their gravitational pull is enormous at a short distance, their overall gravitational field is no larger than a star of the same mass. A starship would be in no real danger of being pulled into a Sol-type star at a distance of 1AU – unless her engines failed and momentum took her closer – and there is no more danger 1AU away from a black hole of one stellar mass. The black hole is infinitely more frightening than a mere main sequence star, however.

Larger black holes are possible. A supermassive black hole has a mass equivalent to a small galaxy and would normally be found at the core of a galaxy. Intermediate black holes with a mass somewhere between the supermassives and stellar black holes are theorised but not yet proven to exist. An intermediate black hole lies at the end of *Deepnight Revelation's* voyage.

All black holes have a Schwarzschild radius, which is the distance within which escape velocity exceeds the speed of light. Since nothing can travel faster than light without using a jump drive, anything within this radius is trapped inside the black hole. The Schwarzschild radius also defines the event horizon of the black hole; according to conventional physics anything occurring within the event horizon cannot affect the outside universe. For a non-rotating black hole the event horizon is the same as the Schwarzschild radius; there are some differences for a rotating black hole but the effect is similar enough in game terms.

In theory it might be possible to use a jump drive to get into or out of the event horizon of a black hole. However, this requires solving the problem of gravitational effects on the drive. Normally a ship would be precipitated out of jump space by a gravity well, so would emerge outside the event horizon rather than jumping in. The ship might then be pulled into the event horizon in normal space, depending on its velocity and the actions of the crew. Jumping out again encounters the problem of jumping within a gravity well. Whilst theoretically possible this would be vastly more dangerous than jumping from within 10 diameters of a planet, which is to say essentially suicidal.

In addition, the effects of the black hole's gravity on a vessel and her occupants would be severe. The intensity of the field is such that moving even a couple of metres closer to the singularity would greatly increase the gravitational forces experienced by the ship or a Traveller within it. The effects are sometimes referred to as 'spaghettification', as objects are stretched towards the singularity until destroyed. Theoretical gravity shielding technology, perhaps derived from the internal gravity systems or drives used by starships, might provide some protection. However, the technology to do this is beyond any race in Charted Space.

JUMP INTERFERENCE ZONE

Travellers will be familiar with the '100 diameter limit' and its effects on jump drive use. The intensity of the gravitational field produced by most bodies is such that a vessel will be precipitated out of jump at 100 diameters and may suffer a misjump if attempting to enter jumpspace within this distance. The 100-diameter rule applies only to bodies such as stars and planets, however. Some bodies and objects have sufficiently high gravitational forces associated with them that they create a Jump Interference Zone out to a much greater distance than their size would suggest.

The most obvious examples are black holes and neutron stars, both of which are incredibly dense but very small. A neutron star with the same mass as Sol would have a diameter of only about 10 kilometres but exerts a Jump Interference Zone out to the same distance as Sol, as it has the same mass and therefore the same gravitational attraction. Sol's diameter is 1.32 million kilometres, making the 100-diameter limit some 132,000,000 kilometres or around 0.88 Astronomical Units. A black hole of equivalent mass would exert the same Jump Interference Zone.

The same system is used for all extremely dense objects; rather than using a 100-diameter limit the Referee should consider the object having a Jump Interference Zone equivalent to a star or planet of the same mass. Jumping to a point closer than the outer limit of the interference zone is not possible. Jumping from inside the Jump Interference Zone is subject to the same hazards as jumping from within the 100-diameter limit of a star or planet of equivalent mass, and jumping from within 10% of this distance is just as dangerous as jumping from within the 10-diameter limit of a star or planet with the same mass.

The Jump Interference Zone can have major implications for the Travellers. For example, the Travellers want to jump to a world orbiting a star, which in turn orbits a black hole. The star has a mass equivalent to Sol and since the planet orbits outside its 100-diamter limit there is no problem. However, the black hole has a mass of about five times that of Sol and thus a large Jump Interference Zone that the Travellers have forgotten about. They discount the black hole as its

100-diameter limit is (they think) tiny, until *Deepnight Revelation* is precipitated out of jump space well short of her destination and on a course that will take her alarmingly close to the black hole.

NEBULAE, GAS CLOUDS & PROTOSYSTEMS

Space is rarely completely empty. Drifting clouds of gas and dust may be thick enough to form a nebula, blocking or scattering light from within, or may be sufficiently dispersed that they are difficult to detect. A gas cloud of sufficient density might begin to coalesce under the influence of its own particles' gravity, perhaps eventually forming a new star system.

Small drifting gas clouds are of no consequence to *Deepnight Revelation* most of the time. She has no equipment to collect useful amounts of particles, although a sample could be taken for analysis. Nebulae, on the other hand, can cause navigational problems or hide star systems and other objects of interest. A nebula will at the very least fill a whole map hex and most are far more than a parsec across. Whilst it is unlikely a nebula could be dense enough to hide a star within it, most will block light from more distant sources and interfere with instruments attempting to detect objects within or on the far side of the gas cloud.

If a gas cloud is dense enough it will begin to coalesce, with clumps of molecules attracting others over time. Such a cloud will begin to swirl in local eddies around clumps of matter that will someday become planetoids or even planets. Larger clumps will grow to become stars and in the interim the temperature of the gas in these regions of the cloud rises. Eventually the cloud becomes dense and hot enough at these points that they become luminous, although these protostars are not yet capable of fusing hydrogen.

As a protostar coalesces, it becomes what is known as a T Tauri star. This body will continue to gain mass and increase in heat until eventually it begins fusing hydrogen and becomes a star in its own right. T Tauri objects are very energetic as a result of gravitational energy released as the gas cloud coalesces, despite them not undergoing stellar fusion. They are variable in the visible spectrum and have high X-ray and radio output. Although cooler than a main sequence star a T Tauri object appears brighter because it is larger.

A mature protostar or T Tauri star will usually be surrounded by a disc of gas and matter. This may include dense clumps of dust, gas and chinks of rock or ice, planetesimals and protoplanets. Planets may also have formed; gas giants and rocky planets are both possible. The disc may be agitated by emissions of gas from the star and there may also be collimated emissions from the star's poles. A T Tauri star system is very energetic and subject to possible disruption due to the interactions of its component parts.

Gas clouds interfere with navigation to varying degrees, depending on their density. Ships jumping into or out of a nebula (or from point-to-point within one) are more prone to misjumps. DM-4 is imposed on any attempt to make a jump into or out of a nebula and DM-2 applies to jumps passing through one.

The denser gas of a protostar is not quite sufficient to prevent a jump through it but imposes DM-4 on all attempts to jump through and DM-8 on attempts to jump into or out of the cloud. Ship movement within the coalescing gas cloud is as normal but sensor operations are subject to DM-2. Small clumps of rock and the occasional planetesimal might be encountered but there is little solid matter within a protostar. A ship venturing to the core of the forming star will be subject to increased heat and radiation but not suffer damage in the short term.

A T Tauri star is a physical object and may be orbited by rocky bodies and gas giants of various sizes. Sensors and jump operations are affected by the gas cloud as by a protostar, with a jump shadow exerted by the coalescing star out to about 7–10AU. Proceeding close to the forming star is as dangerous as approaching any other star, with the added complication that T Tauri stars are variable in their thermal energy and radiation output. The 'safe limit' can move by tens of millions of kilometres in just a few seconds.

USING INTERSTELLAR PHENOMENA

The Travellers may encounter all manner of interstellar phenomena during their voyage. Most can be linked to an obvious cause but this may raise more questions than it answers. A supernova event in a nearby system will hurl matter out in an expanding cloud, which can be encountered in deep space or as it passes through a system. Such an event would be devastating for nearby systems but as the cloud of ejected matter expands it cools and dissipates. Eventually some of this matter may coalesce as part of a new star.

The ejection pattern from a supernova is not uniform in either composition or density, so it is possible to find nearby systems far less badly affected than others. Radiation emissions are likely to have killed all life on nearby worlds but physical effects may vary. It is possible the Travellers might arrive in a system not long after (or before) the particle wave front from a supernova arrives. If so, radiation effects will have occurred in the

recent past but not endanger *Deepnight Revelation*. Encountering a wave front of hot gas might be an unexpected challenge for the Travellers.

Other interstellar phenomena include deep space radio sources or regions that show up on sensors as a gravitational field but have no obvious source. There must always be a rationale for such phenomena; inventing places that are strange for strange's sake can lead to the Travellers losing touch with what is possible and what is not. Any phenomenon or region that seems to defy known laws of physics must have an explanation even if the Travellers never discover what it is. This grounding in real science makes the strange things encountered in the course of the voyage meaningful and interesting. If there are no rules and the Referee just makes up whatever they feel like, strange becomes the norm and nothing stands out.

USING UNUSUAL CREATURES

It is possible the Travellers will encounter space-dwelling creatures or animals with a biology so radically different to those of Charted Space that they seem to defy explanation. As with physical phenomena, there must always be a rationale for any creature, even if the Travellers cannot comprehend it. All living things need a source of energy and some mechanism to support their life processes but this does not need to be a conventional mix of breathable air and recognisable food. Species are known to exist on Earth that use electromagnetic radiation rather than light in an analogue to photosynthesis, or which can survive in conditions previously thought to be completely inimical to life. Such species tend to be very simple on Earth but this does not mean more complex extremophiles cannot exist in the wider universe.

Space-dwelling creatures need to be used with care and in a plausible manner. If the Travellers encounter a giant silicon-based creature in an asteroid field, they may wonder what it eats when there are no passing spacefarers to pursue. The Referee needs an answer to such questions or the bubble of plausibility will be burst. Likewise, extreme creatures of any kind must be used with care. If a species of carnivorous super-dinosaurs lives on a hell world, it must fit into the local ecosystem. This means there must be sufficient lesser creatures to support the population. It may be cool to have the Travellers chased off a planet by a monster the size of a mountain but the Referee must have an explanation for how such an enormous creature supports its own weight and gets enough food to survive.

That said, life can exist in a wide range of environments. Multiple species of gas giant dwelling creatures are known and a few vacuum-dwellers as well. The icy seas of a remote moon, warmed by deepwater volcanic vents, might be home to an intelligent species. However, such people would be very different from humans and interactions might be difficult.

In short, a voyage where every apparently barren world has carnivorous rock-things waiting to eat the Travellers and implausible monsters roam the plains of greener planets, is likely to degenerate into silliness. The main problem is that without a comprehensible set of rules defining what is and what is not possible the Travellers cannot make reasonable predictions about what they might encounter, nor recognise what is out of the ordinary. The Referee is thus well advised to remain within the bounds of plausibility, even if this means many worlds have no life. There are plenty of planets on the voyage route; some will inevitably be mundane and others quite dull. This is no bad thing, as it makes the occasional wonder or mystery all that more significant.

Rather than injecting endless weirdness into the game, the Referee can keep the Travellers interested with mundane but challenging problems. Airless rockballs with no life still pose hazards to the Travellers and their crew, and the crew may become a problem all on their own. An internal feud between two engineering watches is every bit as much a threat to the mission as a giant space monster and far more believable. Encountering something bizarre or which challenges the boundaries of known science should be a memorable occasion, not a 'monster of the week' incident.

CHAPTER THREE

REFEREEING DEEPNIGHT REVELATION

The voyage of *Deepnight Revelation* is a long one – taking literally years to complete. Playing out such an epic undertaking with the normal *Traveller* rules would be an impossible task. Instead, a standard resolution cycle is used to deal with events on a given segment of the journey. The Travellers will never be sure if a given segment will contain major or minor adventures, or be resolved with a single check. It may be that an entire three-month cruise through a series of star systems might pass without incident. This does not mean that nothing happened but small setbacks and minor incidents can be assumed as part of the routine challenges faced by the Travellers. On the other hand, a huge crisis that changes the fate of the vessel and crew could take place over a few hours… and the Travellers can never be sure if those few hours might be the next ones.

USING THE INDEXES

The mission resolution system presented here makes extensive use of the Crew Efficiency Index (CEI) and Detachment Efficiency Index (DEI). These are numbered from 0–15 which, along with modifiers, determine the capabilities of the crew or a segment of it. CEI and DEI are fully explained under Crew Management on page 31.

THE RESOLUTION CYCLE

The resolution cycle will normally be used for a single Reach or important Mission. The cycle is the same each time. First the Travellers plan what they want to do during that cycle, then resolve their attempts to achieve their aims. If an Adventure occurs within the cycle, the focus shifts to more conventional resolution using the core *Traveller* rules.

Determine Aims: The first stage of a resolution cycle is to determine the general aims of the cycle. This will often be something simple and general, like 'transit from the present location to a chosen end point' or 'investigate the strange signals from the second planet of the star system'.

Gather Information: Wise Travellers will want as much information as possible before they decide on their course of action and indeed obtaining detailed information on an important subject might be the aim of a particular resolution cycle. Information might be obtained from sensor data, ideas put forward by the scientific staff or any other source.

Determine Objectives: The aim of a cycle tends to be quite general but the objectives the Travellers intend to achieve will be specific and measurable. Often objectives will facilitate the overall aim, although some will be additional outcomes the Travellers find desirable. The list of objectives in a resolution cycle serves as a plan to be followed by the Travellers and elements of the crew. Typically each objective is the subject of a Mission, although a given Mission may be launched to achieve two or more objectives.

Resolve Missions: Once the Travellers know what they are trying to do, each Mission is resolved, if necessary by being broken down into Mission Segments. Any incidents or Adventures that occur as a result of this resolution process are played out.

Finalise Cycle: The Travellers will determine if they achieved their objectives and overall aim, and begin a new resolution cycle by determining their next aim. In this manner a Voyage lasting years can be broken down into manageable sections, with the focus at times on every word and gesture of the Travellers, and on other occasions a long Reach being glossed over as routine. It is not uncommon for a cycle to have a different outcome to the aim initially planned, which must be taken into account at the beginning of the next resolution cycle.

Example: Reach from A to Z

The Travellers are in star system A and want to reach star system Z in order to move closer to their ultimate objective. This is the aim of the cycle and is fairly general. It might be that the Travellers get as far as system P and decide to begin a new Reach with a different goal or add in more Missions to deal with problems that have arisen or to investigate something interesting along the way. Alternatively, the Travellers might end up at system W instead of Z and consider

this as success as their overall aim was fairly vague – they are closer to their final objective, so they have achieved their general aim if not the specific outcome planned for.

The Travellers begin by gathering information, in this case sensor data on star systems between A and Z so they can plan their route. After looking at the data the Travellers plot a course through systems C, G, Q and X. The objectives for this cycle will be to transit through each system, conducting refuelling operations and a cursory survey of the system. The Travellers are also intrigued by what seems to be an intermittent radio signal from system Q and decide to investigate. This translates into the following plan:

Reach: A to Z
Aim: Transit from A to Z
Objective 1: Arrive in System C
Mission: Transit from A to C
Objective 2: Refuel and Survey System C
Mission: Conduct Refuelling
Mission: Survey the System
Objective 3: Arrive in System G
Mission: Transit from C to G
Objective 4: Refuel and Survey System G
Mission: Conduct Refuelling
Mission: Survey the System
Objective 5: Arrive in System Q
Mission: Transit from G to Q
Objective 6: Refuel and Investigate the Radio Signals
Mission: Conduct Refuelling
Mission: Investigate the Signals
Objective 7: Arrive in System X
Mission: Transit from Q to X
Objective 8: Refuel and Survey the System
Mission: Conduct Refuelling
Mission: Survey the System
Objective 9: Arrive in System Z
Mission: Transit from X to Z

The Travellers then resolve the Missions they undertake, perhaps breaking them down into Mission Segments or dealing with any events that occur. When they reach System Q it is possible the signals will lead the Travellers into an Adventure, which in turn might mean the Resolution Cycle ends at Q. If so, the Travellers will need to include getting to System Z (if they still want to) in the next cycle.

This system does not have to be followed in a strict and formal manner, with flow charts and briefing sessions, but the cycle should be observed. The process of setting aims and objectives then working out the details is an important part of the campaign both in- and out-of-character. It promotes immersion and a sense of achievement and also allows large problems (like voyaging halfway across the Spiral Arm) to be broken down into manageable chunks.

It is important to understand the difference between an Adventure and a resolution element such as a Mission or Reach. Several Adventures can occur during the course of a Mission or none. In other words, each Mission is a task the Travellers or their crew set out to do; Adventures are the interesting bits of what happens along the way.

THE TRAVELLERS ARE THE FOCUS

Not everyone wants to play a senior member of the crew or mission staff but each Traveller should have an important role to play in resolving challenges the ship meets. Many routine situations are abstracted under this system but the Travellers should usually have some input to the process. A situation where officers controlled by the Referee assign tasks to teams also controlled by the Referee, and the Referee then resolves them, can quickly become spectatorial for the Travellers.

Sometimes this is necessary, at least to some extent. If none of the Travellers are associated with the ship's engineering staff and a problem needs to be solved there, it is reasonable for the Referee to create a Mission and determine its outcome. However, when this happens resolution needs to be on a big-picture basis, with details added if the Travellers become involved. This is one of the main functions of the resolution system. Indeed, it may be that the resolution system creates Adventures for the Travellers. A mishap suffered by a detachment of the crew might require intervention by the Travellers to rectify the situation or a botched task might impact the actions of the rest of the crew.

Overall, the Referee should – as much as possible – abstract actions that do not involve the Travellers and focus instead on how they affect the Travellers. A docking error that takes a pinnace out of commission affects the Travellers in several ways even if they are not involved. They may need to source parts to repair it or find a way to manage without it. Likewise, a spectacularly good piece of scientific work might lead to new opportunities for the Travellers. These are indirect consequences but by considering this aspect of the resolution system the Referee can create a wealth of adventure opportunities for the Travellers.

MAPPING AND PLANNING

Deepnight Revelation will be travelling through uncharted space, both in-game and in the Traveller universe. The Referee could, if so inclined, generate every star system along the way. This would be quite an exercise however and most of the work would be wasted unless the Travellers somehow managed to visit every system. A much better option is for the Referee to create a map only when necessary. This applies at any scale; planets need only be mapped if the Travellers have some reason to do it themselves and even subsectors can be abstracted instead of mapped in detail.

The Referee is, of course, welcome to map the path ahead in as much detail as seems necessary but a good balance of detail and speed of progress can be maintained by abstracting some Reaches without creating a map at all and mapping out at most a subsector-sized area around a point of interest when one arises. The latter can be deliberately placed by the Referee or may appear as the result of events in the campaign.

If the Travellers are looking for a habitable world to stock up on food, the Referee might decide to place one somewhere on the route ahead and generate a map of the surrounding star systems. This does not have to be complex; all that is really necessary is to indicate the presence of star systems. Conventionally, *Traveller* uses an asterisk to symbolise a star system about which there is little or no known data, so all the Referee needs is a blank subsector map sheet upon which to indicate the presence of systems within 4–8 parsecs of the point of interest. If the Travellers choose to investigate these, information can be filled in as it is discovered.

It is quite unlikely the Travellers will return to a previously explored area but map sheets can be filed for reference if they do. The Survey Index, explained on page 71, can be recorded next to data on a world. This allows the Referee to tell at a glance how much the Travellers know and how much is still to be discovered. The end result of this method is that the Travellers will produce numerous small maps representing areas they have explored in at least a little detail, with large areas in between recorded only as a region passed through.

This system is not tremendously different from the one used for the campaign as a whole. The regions covered by the expansion books are larger than a bubble of explored worlds around a point of interest but the same principle applies. This system has another benefit for the Referee; it allows a small region or a single star system to be developed in detail and then placed in the path of the Travellers. This ensures the Travellers will experience events the Referee has gone to the trouble of detailing, whereas on a large pregenerated map they may wander straight past.

ABSTRACTING A TRANSIT

A transit, in this context, is a move from one place to another. Often this will correspond to a Reach the Travellers have planned but a transit can take place within a Reach or a long transit might contain several Reaches. The following system is used when the Travellers want to cover ground without undertaking detailed exploration.

The largest single segment of the Voyage the Travellers should be allowed to abstract with a single check is a Reach of 1–2 months. Transits requiring more than this period should be broken down into one-month segments and each resolved separately. A transit may be aborted if the need arises or the Travellers find something that merits a change of plan to allow investigation.

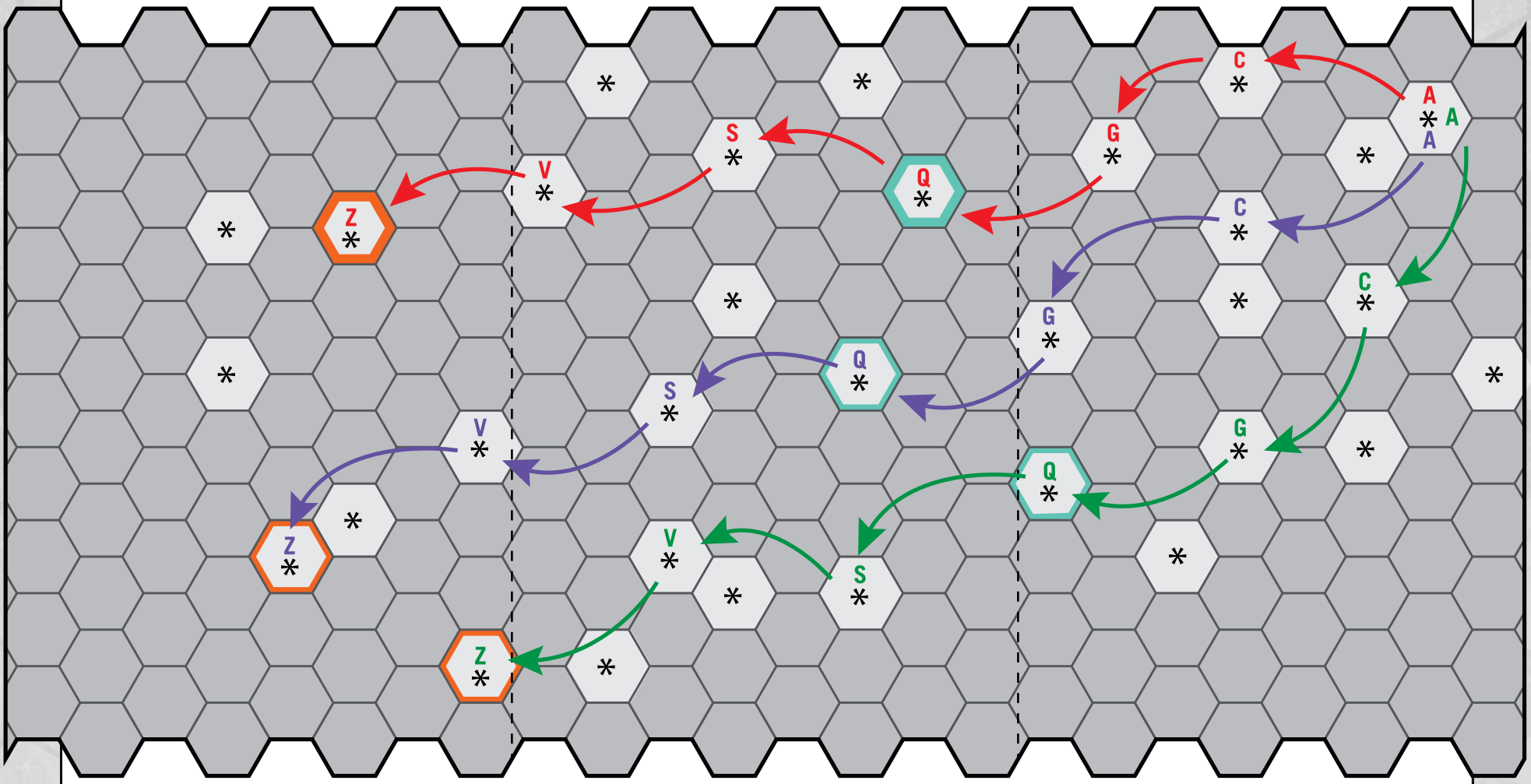
With a maximum jump capability of four parsecs, *Deepnight Revelation* can theoretically advance up to 12 parsecs a month if she makes three jumps. This leaves no more than 48 hours between jumps for refuelling, allowing no real exploration. It places a great deal of strain on the crew and assumes star systems with gas giants for refuelling are available at just the right intervals. A lower rate of progress is far more likely, even if the Travellers are simply trying to move as fast as possible.

Whenever the Travellers want to abstract a transit, they must first decide on their desired rate of progress. This in turn indicates the likelihood of an event occurring, the chance of finding a point of interest and the distance covered. If a transit is broken into several Reaches there is no reason why the rate of advance cannot be varied from one Reach to the next or that one or more Reaches be resolved in detail before returning to an abstract resolution of the overall journey.

Flank Speed: The Travellers concentrate entirely on moving as fast as possible. Exploration activities are limited to navigational sensor scans. Typical rate of advance is 7–12 parsecs per month. The probability is high that the Travellers will have to deal with some incident or event triggered or exacerbated by their rapid progress.

Rapid Transit: A rapid transit is a little more cautious but still emphasises speed over detailed exploration. *Deepnight Revelation* will typically make two or (more commonly) three jumps per month, balancing

MAPPING AND PLANNING



Three examples of easy mapping, symbolising a reach from A to Z.
Q represents something to investigate, either an anomaly or strange signals
C, G, S, V are transit and refuelling points

PRESENCE OF A SYSTEM

Rate of Advance

Rate	Avoid Event	Point of Interest	Parsecs Covered
Flank Speed	10+	12+	1D+6
Rapid Transit	18+	10+	1D+4
Cursory Exploration or Cautious Transit	6+	8+	1D+2
Detailed Exploration or highly Cautious Transit	4+	6+	1D

optimisation of jump range with safety when choosing destinations. It is expected that *Deepnight Revelation* will use this mode of advance for much of her voyage, slowing down to explore promising regions and occasionally dashing through less interesting areas.

Cursory Exploration: A transit made whilst conducting cursory exploration typically involves two jumps or perhaps three shorter ones. More time is spent scanning for points of interest and investigation of the local system is standard procedure whilst *Deepnight Revelation* is refuelling.

Detailed Exploration: A detailed exploration transit will typically involve one or two jumps per month, perhaps accompanied by sending scout ships to neighbouring systems and meeting them after the next jump. Rate of advance is too slow for this to be a viable choice for the whole voyage but it is expected that some areas will be explored in detail, with the occasional stopover to examine something of interest.

If the Travellers have a positive DM for their effective CEI, this can be applied in whole or in part to the checks for Avoiding Events, Points of Interest or to the distance covered. For example, a CEI bonus of +2 could be used to add +1 to the check to avoid an event and one to the distance in parsecs covered. This could, in theory, lead to *Deepnight* Revelation apparently exceeding her maximum rate of advance but since this is an abstract system the Referee can rationalise any discrepancy by assuming the time required for four jumps in a month was 'borrowed' from another transit or that one or more of the jumps took less than the usual seven days and refuelling was extremely quick in between jump exit and the next entry.

Events

An event is more likely to occur if *Deepnight Revelation* is transiting fast than if carefully planning her route. An event must be resolved before the next transit can begin, although the chosen resolution might be 'ignore that and plot the next set of jumps'.

The Events table can be used to randomly generate events during a transit but the Referee can always substitute others. Scripted or pre-planned events can also be inserted either by Referee direction or when the abstract resolution method indicates an event has occurred. The mini-adventures in the *Campaign Guide* are examples of quite detailed events but in many cases incidents will be straightforward and relatively simple to deal with. Events can be used as a starting point by the Referee and developed in different ways each time one occurs.

Events

2D	Event Type
2	Major Supply Problem
3	Major Crew Problem
4	Bad Data
5	Cargo Problem
6	Minor Crew Problem
7	Minor Supply Problem
8	Crewmember Taken Ill
9	Non-Critical System Malfunction
10	Critical System Malfunction
11	Non-Critical System Breakdown
12	Critical System Breakdown

Bad Data: A piece of apparently reliable data turns out to be incorrect. This could be very serious, such as finding a target system does not have a gas giant for refuelling after all or something relatively minor but frustrating, such as a major setback on a research project intended to unlock the secrets of an alien language.

Breakdown: One of *Deepnight Revelation's* systems suffers a breakdown and stops functioning. If this is a critical system such as one of the power plants or the jump drive it may be necessary to halt and make repairs as a matter of urgency. Less critical systems include weapon batteries and scientific facilities necessary to the mission but not the function of the ship. A breakdown might lead to new adventures as the Travellers seek necessary resources in dangerous places. If the Travellers elect not to make repairs they will have to live without the broken down system until they do.

Cargo Problem: Something stored aboard *Deepnight Revelation* is missing, damaged or rolling around in the cargo bay bashing into other things. The problem might be with a vehicle or small craft, or something far more dangerous like a nuclear demolition charge. Alternatively, a storage area may be leaking something noxious or found to be standing open and empty when it should be securely storing an important or dangerous item.

Crew Problems: Most crew problems are minor and/or involve only a few people. A minor crew issue will normally involve petty thievery, inadequate work or a dispute between individuals that disrupts the harmony of the vessel. A more serious issue occurs where a series of minor incidents escalates into a serious morale problem or internal dispute between groups or departments. An unresolved minor problem may become major or it already has by the time it comes to the notice of the Travellers.

Crewmember Taken Ill: A crewmember or officer comes down with a serious illness, which may or may not be contagious. This could be very serious, with the Travellers trying to stop the spread of disease through their crew, perhaps as a result of some object brought aboard or deliberate hostile action. The disease might be a straightforward sickness but could also be something more insidious such as a malady that causes irritability and then psychosis. Given the duration of the mission it is possible that the illness is simply exhaustion but this can still be very serious if it affects people around the exhausted crewmember. For example, an officer might struggle to discharge their duties whilst concealing their state, eventually leading to bad decisions putting others in danger.

Malfunction: Malfunctions are less serious than complete breakdowns but can still be troublesome. Any attempt to use the malfunctioning system before it is repaired will be subject to negative DMs at the Referee's discretion. For example, a malfunction of the portside hangar entry doors will impose a negative DM on attempts to launch and recover craft on that side but not unduly harm the overall performance of the ship. On the other hand, a malfunction of the main power plant will be alarming and potentially life-threatening. Malfunctions may be temporary, permanent or intermittent. The latter may cause problems when a mysterious malfunction reappears just when the affected system is needed most.

Supply Problem: The Travellers discover that a proportion of their supplies have spoiled or otherwise become unusable. They will need to find a new source of supply as a matter of urgency. A variant on this theme might be a need to find some antidote or counteragent to prevent spoilage or corruption of other supplies. Typically a minor supply problem indicates 1Dx5% of remaining supplies are unusable. A major supply problem indicates 3Dx5% of supplies are unusable.

Points of Interest

Sometimes a point of interest will be detected during a transit. Most are relatively mundane or of minor importance, such as astrophysical phenomena that do not affect the course of the mission. As with events, the Referee can flesh out the Points of Interest table in any manner that seems suitable. Care should be taken, however, not to drop setting-changing concepts into the game universe on a random roll.

Anomaly: The Travellers become, or are made aware that, something strange is in their stellar neighbourhood. Minor anomalies will usually be astrophysical in nature, such as flaring of a previously stable star or a rogue asteroid entering the system, whilst a major anomaly may be something more mysterious such as a weird fluctuation in the gravity field around an object. Anomalies of that sort should be used with care, however, and should always have a plausible explanation. Traveller is a hard-ish science fiction game, so whilst anomalies that cannot be explained with current science are acceptable, weirdness for its own sake is not. Anomalies can turn out to be false alarms or the product of the crew's fatigued imagination but if the anomaly turns out to be something real, the Referee should decide how significant it is to be. A new alien race will be in the setting forever, while a star that goes nova and incinerates its mainworld will have widespread effects – and rather permanent ones in the local vicinity!

Encounter: The Travellers have encountered evidence of people. Most commonly this will be the ruins of a vanished mid-tech or lower civilisation, or a race who are still at the pointy-stick level of technology. Occasionally there may be signs of spacefarers or even an encounter with them.

Mainworld: There is something interesting about a world in the warm zone of the star system. A paradise world is almost too good to be true and may be a rich source of supplies. A habitable world is less welcoming but still near perfect for humans, whilst a hell world might look like it is but conceal nasty surprises. Mainworlds might also have an unusual ecosphere or conditions such as an ice age, or developed life based on an entirely different set of conditions to the oxygen-nitrogen norm.

Outsystem World: There is something unusual about one or more bodies in the outer system. This will usually be physical conditions such as a highly eccentric or retrograde orbit but other conditions are possible. A close binary planet pair would certainly be interesting,

Points of Interest

2D	Type	1D	Point of Interest
2	Anomaly	1	Windfall
		2	Major Anomaly
		3–6	Minor Anomaly
3	Stellar Body	1	Highly unusual stellar body type
		2–3	Unusual stellar body type
		4–6	Unusual stellar body characteristics
4	System Composition	1	Multi-star system
		2	Large companion system
		3	Unusual distribution of bodies
		4	Unusual composition of bodies
		5	Unusual orbital characteristics
		6	Multiple habitable-zone bodies
5	Rogue Bodies	1–2	System is in the process of ejecting multiple bodies
		3–4	System is in the process of capturing a major body such as a gas giant with moons
		5–6	A rogue body is in the process of passing through the central system, causing disruption
6–8	Phenomenon		An interesting or impressive but mundane phenomenon exists in the system
9	Mainworld	1	Paradise world
		2	Habitable world
		3	Hell world
		4	Unusual ecosphere
		5	Unusual temporary conditions
		6	Unusual permanent conditions
10–11	Outsystem World	1	Unusual orbital path
		2	Binary planet
		3	Complex moon system
		4	High radiation
		5	Life of an unusual sort present
		6	High-gravity super-earth
12	Encounter	1–2	Ruins
		3–4	Intelligent Beings
		5	Transmission
		6	Sighting

as would a 'world' that is actually a cluster of large planetoids and dwarf planets orbiting a common point.

Phenomena: Most points of interest are impressive or scientifically significant without being inexplicable. A gas giant with particularly beautiful rings or an incredibly complex moon system would be a sight worth seeing, as would many other unusual but 'normal' phenomena. Flaring from a star or the aurora created by solar wind in the atmosphere of a highly magnetic planet are noteworthy phenomena without being considered anomalies.

Rogue Bodies: The system has one or more major rogue bodies associated with it. A gas giant in the process of ejecting its moons from the system or one that is in the process of being captured, would be interesting to space scientists. A planet or even a star moving through the central system would cause utter mayhem and certainly be worth studying.

Sighting: What appears to be evidence of a starship or space-going creature is sighted. This may be a direct observation or secondary evidence such as gravity 'ripples' from a jumping starship picked up from a neighbouring system. Any starfaring species is likely to be of great interest to Mission staff, who may push for a search even if it means delaying the voyage.

System Composition: The composition of the system varies considerably from the norm. This may indicate additional stars or a distant companion with far more planets than would normally be expected. Alternatively, the system might have an unusual distribution of bodies, such as an almost empty inner system, but multiple planets orbiting very far out, or the bodies may lie in eccentric orbits. A system with more than one potentially habitable planet would be a rare find.

Stellar Body: There is something unusual about a nearby star or stellar body. A star system orbiting a black hole or neutron star, or orbiting a star that orbits one, would be highly unusual, whereas a supergiant star or brown dwarf as the primary of a system would be considered unusual. Alternatively, a stellar body might have unusual characteristics such as being composed of a different element mix to the norm or it might be a T Tauri star or protostar in the process of forming. The unusual stellar body might not be the primary of a system; it could be a distant companion.

Transmission: The Travellers pick up what appears to be a transmission. It may come from an automated beacon or been transmitted long ago and far away. The signal might turn out to be a natural phenomenon with no meaning or it could be a trap. Alternatively, a signal could be a distress call or almost anything else.

Windfall: The Travellers get lucky, finding something useful or valuable. This might be directly beneficial such as a rich source of supplies or exotic materials found in the wreck of an alien spacecraft. Something worth a fortune back home, such as a super-rich deposit of platinum in an asteroid field, might put the mission in perspective – the Travellers just found something worth billions in Charted Space but out here it is of little value.

QUICK SYSTEM GENERATION

Star systems can be generated using any method the Referee sees fit. The system in the *Deep Space Exploration Handbook* in *The Great Rift* set is particularly well suited as it begins with the star and proceeds from major to minor bodies in the order explorers are likely to detect them. However, it may be that the Travellers want basic information on several star systems in order to select a route or find a source of supplies. In this case a quick method is used to determine the necessary information.

Note that this method tells the Referee what is present in a star system but the Travellers might not necessarily have that information. The Survey Index for the system should be noted, allowing the Referee to refer back and quickly determine what available information the Travellers actually have.

The first stage of this minimalist mapping system is to determine the presence of star systems in each parsec hex within the area of interest. The probability of a star system depends upon the region of space being searched, as shown on the Star System Presence table.

Star System Presence

Region Type	Presence of Star System
Cluster	1–5 on 1D
Dense	1–4 on 1D
Average	1–3 on 1D
Sparse	1–2 on 1D
Rift	2 on 2D
Void	3 on 3D

The next question is whether fuel can be readily obtained in the system. Presence of at least one gas giant typically ensures this is the case. The likelihood of a gas giant being present depends greatly upon the System Density Index, discussed on page 8.

To determine the density of a star system, the Referee should roll 3D-3, with an additional 1D-1 for every natural 6 that is rolled. These additional dice do not

generate further dice even if they come up 6s. The end result is a System Density Index with a probable value of around 8–11 and an extreme upper limit of 30. The Referee should note the System Density Index but need not determine the exact composition or even number of planetary bodies.

The System Density Index is used as a discretionary DM to determine the presence of suitable bodies such as a habitable world or gas giant on the Specific Bodies table. The DM may be divided up between rolls as the Referee sees fit.

Specific Bodies

Type	1D+ DM
Gas Giant Suitable for Refuelling Operations	9+
Borderline Habitable Mainworld	9+
Habitable Mainworld	12+
Planetoids Suitable for Mining	10+

Checks can be made in any order. Each body must be rolled for separately and at least DM+1 from the System Density Index must be applied to each roll. Once no DM remains, no more checks can be made. A borderline habitable mainworld may have a very limited ecosphere or tainted atmosphere, little or too much water, or other less than ideal conditions. Worlds with just the right mix of air and water are rare but far more valuable as locations for rest and recreation, and of course food resupply.

For example, the Travellers are interested in a star system lying ahead on their route. They determine its System Density Index as 10. The Travellers need to be sure the system has a gas giant for refuelling so the Referee uses 6 points of the System Density Index as a DM on the 1D roll of the Specific Bodies, making it virtually certain they will detect a suitable gas giant. The roll comes up a 6. There are 4 points of System Density Index left over and those go to rolling for a borderline habitable mainworld. The roll is a 4, for a total of 8, so there is no suitable world in the system. There are no System Density Index points left to roll for planetoids that could be mined.

This does not mean these bodies are definitely not present. This quick system is used to determine if a body is definitely there but it may be that when (or if) the system is fully generated a suitable mainworld, planetoids and several gas giants turn out to be present after all. The quick system represents the Travellers scanning for something they want to be present and being sure they have detected it; the full generation system indicates what is actually there.

RESOLVING A MISSION

A Mission is a self-contained set of objectives the ship or crew set out to achieve and can be resolved in as much detail as the Referee desires. It might be interesting to play out every meal in the galley and every maintenance session but in most cases the routine can be glossed over until something goes wrong or an interesting event occurs. A Mission has a distinct beginning and end but can be long or short depending on circumstances. Missions are broken down into Mission Segments and Operations.

The Mission: A set of tasks and objectives the ship or crew are ordered to complete.
Mission Segment: A distinct subdivision of the overall mission, such as occurrences during a visit to one of the several star systems the ship is ordered to pass through. A segment may conveniently group some of the ship's tasks or be defined by the ship entering and leaving a particular star system.
Operation: A specific job undertaken by the crew during a mission segment. A single operation can expand into a whole Adventure if something goes wrong.

For example, Deepnight Revelation is in the middle of a Reach involving a transit through several star systems. One of her Missions on the way is to investigate curious radio signals coming from a planet. She also needs to conduct refuelling operations but that is a separate Mission.

The refuelling operation is resolved in little detail as it is a routine occurrence and does not result in any unusual incidents. The investigation is a little more complex and requires planning on the part of the Travellers. They decide to send two small craft to conduct an orbital survey of the world, with one craft landing a team to carry out the investigation and the other remaining in orbit as backup and rescue if needed. This mission could be resolved with a single check if the Referee thought it suitable but in this case they decide to break it down into segments.

A Mission can be given a title. Often this is something descriptive like **Mission: Investigate the Radio Sources at System VQ-2203** but may be a randomly created designation like **Mission: Operation Violet Dawn**. Titles are not necessary but help the Travellers keep straight what the various elements of the crew are doing.

The Mission is planned much like a Reach but in closer focus. Mission planning will usually follow a standard format. Once the Travellers are used to this kind of planning the process can be quite informal but

a Mission still needs a plan of some sort – if only so the Travellers can let the Referee know what they are trying to do.

The standard mission format is as follows:

Mission Title
Objectives (these can be phrased as orders to the crew or objectives to be achieved)

Mission Segment
Operations required to complete that segment
Mission Segment
Operations required to complete that segment (as many segments as necessary)
Completion Conditions

Investigate Radio Sources at System VQ-2203 (Example)
Objectives: Investigate Radio Sources at System VQ-2203. Retrieve useful or interesting artefacts. Investigate site for information. Return to *Deepnight Revelation* within 72 hours.

Mission Segment: Conduct orbital survey
Mission Segment: Locate source of the signals
Mission Segment: Search planetside location
Operation: Land shuttle
Operation: Find source and investigate at ground level
Operation: Retrieve Artefact
Operation: Obtain any additional information
Mission Segment: Return to shuttle and climb back to orbit
Completion Conditions: Make rendezvous with *Deepnight Revelation* within 72 hours

These could be broken down further if the Referee chooses, such as resolving specific Operations to carry out the orbital survey in detail. However, the Travellers have sent crewmembers to carry out this Mission and are not present, so the Referee is mainly interested in whether something goes badly wrong and requires their intervention. The Referee does consider it important to know how well the landing party conducts its search, as the source of the signal is a dangerous artefact. A good result will give the Travellers some idea what they are dealing with; a bad one will see the artefact labelled as harmless and brought aboard *Deepnight Revelation* without a full set of precautions in place.

Note that not all Missions require this level of detail. A Mission such as 'we send a shuttle to pick up the landing party' will often be resolved as a single check. Only when details matter should a Mission be broken down and resolved in turn.

REMOTE MISSIONS

Sometimes the Travellers will send people out to do a job and receive a report on the result – a report generated by a single check at the Mission level, more than likely. However, if a Mission is important or hazardous it can still be a roleplaying opportunity for the Travellers even if they are not present. They will receive transmissions from the survey party, perhaps retransmitted by the orbiting shuttle, updating them of the situation as the Referee resolves each mission segment.

The survey is complete… location identified. Descending to planetary surface. Landed safely. Ground team away. We've found it. It's metallic… unknown alloy. Low level of transmissions. No response to our sensors or transmissions. Attempting to retrieve. Reached shuttle. Taking off…

… Deepnight Revelation, this is Shuttle Two. Shuttle One is down. Apparently crashed on take-off. No response to comms. Request permission to descend and begin rescue operations…

At this point an Adventure has begun. Should the Travellers authorise a rescue? Should they abandon their people or order the second shuttle crew to proceed with extreme caution whilst their colleagues may be dying below? Was the artefact the cause or was this a simple pilot error? The Travellers are aboard a different vessel, half-refuelled, at least a few hours away. What should they do?

This is a different slant to the adventuring experience to where the Travelers are the shuttle crew, and it requires a different sort of response. The Travellers have responsibility for the whole ship and her company – as well as the shuttle crews. They may come to yearn for the simpler days when they had only themselves to worry about but this is what it is to command a starship and her crew.

Resolving Missions

The same process is used to resolve each level of action; the question is simply one of detail. Resolving several Operations will complete the Mission Segment but if the Referee prefers, a single check could be made for the Segment. Resolving all Segments completes the Mission but of course the Mission as a whole could be resolved with a single check if desirable. The Referee is free to decide on the level of detail and should as a rule use the broadest level by preference unless details are important.

Resolution of an Operation, Mission Segment or whole Mission uses the crew's CEI or the DEI of the detachment or Division carrying out the task. Many Missions will go off without a hitch and any part of one can be narrated rather than resolved using dice if the Referee chooses. It is up to the Referee whether manoeuvring out of port is played in detail, resolved with a single CEI or DEI check, or simply narrated in as much or as little detail as desired. As a rule, the more chance there is for something to go wrong, the more likely the Referee will want to play out the scene.

For abstract resolution, an appropriate Traveller makes a 2D roll and adds the modifier for CEI or DEI, as determined by the Referee. Any modifiers from the Resolution Modifier table are also applied to this check. The result is then determined by the Resolution table.

Resolution Modifiers

Circumstance	Example	DM
Specialist or expert assistance available	The crew contains a scientist whose PhD is in the relevant field.	+2
Improved equipment or lavish resources available	The Travellers brought along a machine for this specific task or extra spares in case needed.	+1
Operation carried out under pressure	There is only just enough time to make repairs before *Deepnight Revelation* falls into the giant planet's atmosphere.	–1
Operation carried out under extreme pressure	We need to fix the drive and escape but there is a firefight going on in the corridor outside.	–2
Distractions	The damage control party are necessary but keep getting in the way even as they try to hold the fire back from the repair team.	–1
Difficult circumstances	Flying the ship from a holed bridge, in vacc suits, whilst the damage control teams clear bodies of crewmates.	–3
Reluctance	The crew have lost confidence in the command team or their own abilities and are reluctant to take on a task they expect to fail at.	–1
Internal Divisions	Some elements of the crew are on the brink of mutiny and ignore orders they disagree with or openly challenge them.	–3

Multiple factors can apply but the Referee should be cautious about making things too easy for the Travellers. If they are allowed to claim several advantages every time they do anything, the actual competence of their crew becomes meaningless.

Resolution

2D+ Modifiers	Outcome
0 or less	The task was a fiasco and not completed. A Mishap occurs.
1–2	The task dissolved into chaos and was only partially completed. A Mishap occurs.
3–4	An obviously poor performance that embarrasses the ship and her officers. An Incident occurs.
5	A sloppy performance but maybe nobody saw the mistakes. Roll 2D: On 10+ a Mishap occurs.
6	The job got done but there was an Incident.
7	The job got done. Some crews will be satisfied with this level of performance; some would be relieved that it went off okay.
8	A decent job, with room for some lessons learned. However, an Opportunity occurs during the operation.
9–10	A solid performance, good enough to satisfy even a critical observer.
11–12	A textbook performance. Roll 2D: On 12+ the crew gains MOR +1.
13–14	Near perfect resolution, as good as anyone would expect in an exercise. Roll 2D: On 10+ the crew gains MOR +1. An Opportunity occurs.
15 or more	Everything goes perfectly. Less experienced crewmembers are given a chance to try their skills in a 'live' situation and even they perform brilliantly. Anyone watching would think this was a staged propaganda film. Roll 2D: On 8+ the crew gains MOR +1. An Opportunity occurs.

Notes on Resolution

Any Mission, Mission Segment or even an Operation can be expanded into an Adventure or the resolution system can be used to simply abstract everything that happens. However, the latter is best suited to a solo game. A Referee can use the resolution system creatively to generate impromptu Adventures that will test the Travellers' skills. Some may be 'mini-adventures', short scenes to be played out in a few minutes, whilst others can be lengthy.

Segment resolution can generate Adventures in a variety of ways. For example, the Referee might resolve the current Mission Segment and present the Travellers with the situation as it unfolds – an Adventure happening whether or not they want it – creating a situation for them to deal with based on the outcome indicated. Alternatively, the Travellers might be presented with a report on how things went and then have an Adventure as they question those responsible for the fiasco in the hope of determining just how it all went so badly wrong.

The Travellers will often delegate tasks and thus lack direct observation of how they were carried out. This can create interesting situations in which they have to sort out the aftermath without concrete information. For example, the Referee rolls to resolve the loading of supplies, smiles cryptically and informs the Travellers that the junior officer in charge of the transfer reports the ship is loaded and everything squared away. A few minutes later a whole lot of alarms go off. Garbled calls are coming in about something alive in the cargo bay. Surely the report did not say it had busted out of a bulk supply container..?

Note that the resolution system is intended to give the Referee an indication of how things went. The Travellers may not be so certain; things look okay but something could have gone wrong or an apparent shambles might have resolved itself in the end. The Referee can always decide that dice rolls are all there is to an incident and likewise always has the option to expand a segment or create an entire Adventure from the results.

Improving Performance

CEI checks differ from skill checks in that they represent a team effort making use of a great many skills. Such activity could be modelled using a truly gargantuan task chain but even then there are factors that would not be represented. These include the ability of the crew to work together and the overall competence level of the personnel involved.

Most CEI checks produce a positive outcome, in that the job will get done. However, a crew with mediocre CEI will perform their tasks in a sloppy and less-than-effective manner. This does not mean that everything has to go wrong in grand style. An Incident or Mishap indicated by the CEI check can be minor or trivial; something reported as a footnote rather than a crisis the Travellers have to deal with. A string of such minor incidents should alert the Travellers to the fact that their crew is not performing as well as might be hoped.

One solution is to find ways to increase CEI but this is a long-term undertaking and may not be possible under the circumstances. The alternative is for the Travellers to create favourable circumstances for the task. Lavish equipment or expert advice can be simply factored into the CEI check as a modifier but additional DMs are available if the Travellers find a way to make use of their skills.

This will usually require an Adventure. For example, rather than simply abstracting arrival at an alien homeworld as a CEI check, the Travellers can roleplay it. The captain gives orders, other officers liaise with the local authorities and the Referee calls for a Pilot check from whomever is in charge of the docking manoeuvre. This does not necessarily mean the pilot – aboard a big ship the pilot typically implements the orders of a senior officer who is in charge of manoeuvres.

A well set up docking manoeuvre will gain the Travellers DM+1 or at most DM+2 on their CEI check, providing their own skill checks produce a positive outcome. The Adventure is played out using the core *Traveller* rules, after which the scale changes back to whole-ship operations.

INCIDENTS

An Incident is an event of note that occurs during resolution of a Mission, Mission Segment or Operation. It might be minor in nature but depending on how it is dealt with could spiral out of control. An Incident may lead to an impromptu Adventure or short session of roleplaying as the Travellers sort out the mess. It could also be abstracted with an ECEI check if the Referee desires but on the whole Incidents, Mishaps and Opportunities are intended as Adventure leads.

When an Incident occurs, roll 2D and consult the Incidents table. The Referee should tailor the severity of the Incident to the situation; an out-of-the-ordinary happening whilst giving a lecture on naval deployment strategy to new officers is likely to be less serious than one that occurs whilst conducting live fire training. Note that Incidents are not always negative in nature.

Incidents

2D	Outcome
2	Something goes sufficiently badly wrong that the Incident becomes a Mishap.
3	An equipment breakdown causes difficulties for the detachment or crew. For example, the main sensor processing centre suffers a software glitch and has to be rebooted whilst the ship is trying to scan local traffic. The Travellers will have to figure a way around the problem, which cannot be fixed in time to complete the task at hand.
4	A discipline problem occurs during the operation, disrupting the work of everyone involved. A heavy handed solution might cause further resentment but letting crewmembers get away with indiscipline will lead to more problems in the future.
5	The operation is made more complex by changing circumstances. This will usually be something more inconvenient than deadly, such as equipment malfunction, unexpected environmental change, or some other source of unnecessary delay and difficulty.
6	Some of the necessary equipment is unexpectedly missing, offline or out of commission, requiring a creative workaround or hurried fix.
7	A minor hiccup occurs, such as an infraction of regulations that requires a hearing and disciplinary action. This might be embarrassing in front of outsiders and could have repercussions if the crew are discontent.
8	Something unusual is spotted; a sensor blip, an intriguing arrangement of planets and other bodies in the system, strange atmospheric composition or something equally puzzling but not immediately threatening.
9	A crewmember or detachment demonstrates unexpected resourcefulness and gets the job done better and quicker than expected.
10	A typically uncooperative crewmember pitches in with a will and is helpful in completing the task. The reason for this change of heart is not immediately obvious.
11	The task requires dusting off an unusual piece of equipment or trying out a technique not normally used. Make a Difficult (10+) check using CEI and if successful, gain MOR +1.
12	Things seem to go pretty well and in the middle of the task an Opportunity occurs.

Mishaps

2D	Outcome
2	Structural damage is taken or a weakness is detected. The ship loses 2D% of its Hull points until properly repaired.
3	The ship is involved in a minor collision with a small craft or object, or causes a similar incident to happen to another craft.
4	A major system such as the spinal weapon or a drive develops a fault that makes it erratic. Impose DM-1 on all checks involving that system until repaired.
5	One of the ship's minor systems, such as a single small craft or a point-defence battery, suffers a malfunction and is out of action until fully repaired.
6	A crewmember is seriously injured, requiring investigation.
7	A crewmember suffers a minor injury, which may well be his own fault.
8	A crewmember causes injury to someone, creating a possible Incident.
9	A crewmember manages to insult or offend someone.
10	One of the vehicles or small craft involved in the task suffers a serious malfunction or a working party has an accident and requires assistance.
11	The Travellers are given cause to suspect their plan for the current task is based on faulty data. This could be serious, such as a failure to identify an atmospheric taint or a mis-estimate of the surface gravity of a nearby world. The bad information may impose DM-2 on all checks connected with it or pose a more direct hazard.
12	A Crisis occurs. See page 27.

A task that results in an Incident will often be expanded into an Adventure – at least a short scene or two – unless there is a pressing reason not to. The exception is where the Referee decides to let the apparent result stand and have the incident come to light – or become important – later. Incidents make the voyage more interesting for everyone involved and give opportunities for roleplaying that will make the expedition 'come alive' in the minds of the Travellers. Yet another gas-giant refuelling sweep might become memorable as 'that time we plunged right into a flock of gas-sharks.' Incidents do not need to lead to major events, just interesting ones.

Mishaps should always be expanded into an Adventure unless there is a good reason not to. In many cases, the Travellers will become aware of the mishap after it has occurred and have to deal with the outcome. For example, if a drive fault makes one of the shuttles difficult to fly the Travellers will likely learn of it in a routine report, probably accompanied by details of the repair. However, depending on the crew and how the Travellers treat them, the technicians might try to conceal the fault and fix it without anyone knowing – especially if negligence was involved. In some cases, typically a low-morale ship whose command crew are harsh on those they blame for failure, the fault might go entirely unreported and only come to light later… perhaps when the shuttle is urgently needed for a rescue.

Much depends on how the Travellers treat their crew and how motivated and professional the crew are. This is indicated by the ship's CEI and general nature of life aboard. In some crews the 'vertical stroke' falls upon everyone above the perpetrator of a mistake – or the person who gets the blame – regardless of how fair or unfair it may be. In such an environment, blame-deflection may be more important than fixing the problem, which in turn creates an atmosphere of paranoia and mistrust among the crew while officers conceal their subordinates' shortcomings and try to avoid censure rather than doing a good job and being honest when something goes wrong. Thus a Mishap might go unreported for a time, then suddenly become critically apparent when something else is going on.

CRISES

A Crisis is a serious mishap that has potential long-term consequences. A Crisis is always grounds for an Adventure and can usually be averted by prompt and decisive action. The Crisis tables below give an indication of the nature and Severity of each Crisis but the Referee can modify them as appropriate.

For Severity of the Crisis, roll 2D on the Crisis Severity table with the following modifiers:

More than two years into the voyage	+2
Per additional full year into the voyage	+1
Regular maintenance and training not undertaken	+2
Major maintenance undertaken within last 12 months	-1
Full overhaul undertaken within last 24 months	-2
Other DMs at the Referee's discretion or as directed by the voyage storyline	

At the outset of the voyage, *Deepnight Revelation* benefits from having a full overhaul just completed and major maintenance undertaken, for a total DM-3 during the first year of the voyage and DM-2 for the second. However, a lazy or ineffective crew that does not stay sharp and look after the ship properly will run into trouble. Crises are likely to be more severe in later years of the mission as the ship becomes worn and the crew lose their edge.

The nature of a Crisis is determined in a general manner using the Crisis Nature table or at the Referee's discretion. For example, if the ship and crew are engaged in planetside operations and a Mishap becomes a Crisis, it would make sense for the Crisis to threaten the crew or small craft, rather than the parent starship in orbit. However, the Referee is encouraged to be creative. Any evolution can be derailed by a totally unrelated problem occurring elsewhere. A Crisis could also be used to reintroduce a previous problem. Perhaps a troublemaking crewmember returns to his old ways and goes too far or a malfunction thought to be fixed reappears. Perhaps the Crisis is a problem that has existed for a while which now becomes worse; the erratic drive becomes even more unreliable or perhaps something got aboard at the last habitable planet and has been living in the ventilation ducts…

Crisis Severity

2D+ Modifiers	Result
3–	False Alarm. A potentially threatening situation was (probably correctly) reported as posing an imminent threat but on further investigation the danger was small and easily manageable.
4–6	Serious Mishap. The situation is not as bad as at first it seemed and should be treated by the Referee as a worse version of a standard Mishap.
7–9	Minor Crisis. A real and threatening situation exists, with potential long-term consequences.
10–12	Major Crisis. The situation has the potential to impair the ship or crew to a significant degree.
13–15	Severe Crisis. The situation could cripple the ship or kill several crewmembers.
16+	Disaster. The situation has the potential to destroy the ship.

Crisis Nature

1D	Crisis Nature
1	Crew
2	Ship System: Sensors and Weaponry
3	Ship System: Jump Drives and Power
4	Ship System: Navigation and Manoeuvre
5	Ship System: General (hull, life support, internal gravity and so on)
6	External

An **External** problem could be something unconnected with the ship, such as a rogue planetoid on a collision course or a volcano erupting planetside, or might endanger one of the ship's craft. Other Crises concern elements of the ship and its mission, and should be tailored by the Referee.

Resolving a Crisis

A Crisis requires an Adventure to resolve it. This might be something quite simple, like redirecting crew from their current tasks to deal with the problem but the more severe a Crisis becomes the greater effort should be required on the part of the Travellers. If the Travellers fail to resolve the Crisis or cannot react in time, the effects are as follows.

False Alarm and **Serious Mishap** results should not have enormous significance for the ship or crew. At most the Referee should impose a more severe version of a Mishap result.

Crisis Outcome

Crisis Severity	Crisis Nature	Effect
Minor	Crew	1D crewmembers injured and unfit for duty for 2D weeks
Minor	System	System Degraded: DM-1 on all tasks involving it until properly repaired
Minor	Hull	1D% of remaining Hull points lost
Major	Crew	1D crewmembers killed. ECEI reduced by –1
Major	System	System Permanently Damaged: Reduce performance by 1 level or apply DM-2 on all tasks involving it until repaired or replaced
Major	Hull	3D% of remaining Hull points lost
Severe	Crew	2D crewmembers killed. ECEI reduced by D3. CEI reduced by –1
Severe	System	System Disabled: Inoperable until repaired and afterward reduce performance by 1 level or apply DM-2 on all tasks involving it until repaired or replaced
Severe	Hull	6D% of remaining Hull points lost
Disaster	Crew	3D crewmembers killed. ECEI reduced by –1D. CEI reduced by –D3
Disaster	System	System Destroyed: Replacement or rebuild required
Disaster	Hull	12D% of remaining Hull points lost

A Crisis can be partially or completely averted by an Adventure. If the Travellers are partially successful the severity of the outcome may be reduced one or more levels. Harm can also be spread out in different areas if this seems plausible, rather than restricting damage to one system. For example, the Travellers suffer a Crisis and the Referee determines it is a System: Sensors and Weaponry incident of a Severe nature. The Referee decides that power capacitors for the spinal weapon have suffered an explosion, injuring some crewmembers and starting a fire.

If the Travellers do nothing or fail to respond, the spinal weapon will be inoperable until repaired and will never work properly again. They come up with a course of action that seems workable and have a good go at mitigating the damage but are ultimately not entirely successful. The Referee imposes a Minor Crisis outcome – the spinal weapon has suffered damage and operates with DM-1 until properly repaired. Of course, obtaining the necessary rare materials to fabricate components might require another Adventure. The injured crewmembers are a short-term consequence in this case; no permanent effects are imposed on the vessel and crew.

Degraded, disabled and destroyed systems can repaired. See Repairs and Replacements on page 58.

OPPORTUNITIES

An Opportunity is the opposite of a Crisis in some ways. It can, in most cases, be safely ignored and will usually have a positive effect if the Travellers put effort into exploiting it.

Opportunities

2D	Outcome
2	The Travellers gain knowledge of something very special in the local region. This might be a previously unknown civilisation, wondrous phenomenon or source of rare materials.
3	During the task the Travellers make a valuable find, such as a stash of components mislabelled and forgotten in an obscure storeroom.
4	Some of the crew have found a way to fix a previously impossible problem. The Travellers gain a free repair effort (see Repairs and Replacements on page 58) or similar advantage.
5	A piece of highly useful data is obtained. The Travellers may 'cash in' this find at a later date, in return for information from the Referee or a bonus to resolve tasks during a Mission.
6	Routine intelligence-collation produces a lead on something worthy of investigation, such as a planetoid belt with rich resources or a star with unusual characteristics.
7	The current task turns out to be much easier than expected and is completed in record time or without difficulties.
8	Inaccuracies in the supply logs turn out to be in favour of the Travellers for once. There are more of what is needed than expected, allowing the current task to be completed without expending resources or supplies expended this week to be effectively replaced.
9	Someone finds additional uses for standard equipment or a technique that improves efficiency. DM+1 applies to all checks for the remainder of this Mission.
10	An exceptionally good idea is presented to the Travellers, greatly simplifying current tasks. DM+1 applies to all checks to resolve tasks throughout the current Reach.
11	A piece of equipment aboard the Travellers' ship turns out to be a non-standard variant with additional functions. These were not a great success and not integrated into future designs, which means few people know about them. On one occasion when the Travellers face a technical problem (for example, inability to resolve critical sensor data) this capability provides a solution.
12	A non-Traveller crewmember turns out to have had a very respectable academic career or interest in an obscure subject that has now become useful. Their long-disused knowledge of obscure alien art, dead languages or rare jumpspace phenomena can be defined at any time the Travellers want, providing a solution to an otherwise difficult situation.

Like Mishaps, Opportunities are begging to be expanded into Adventures. They tend to be less immediate in nature, however. In some cases, the opportunity is something the Travellers become aware of and can choose to follow up or use to their advantage at a later date. In other cases, the Opportunity might not present itself straight away. For example, the table indicates the Travellers make a valuable find, so the Referee decides that the next star system to be visited contains alien relics that will be useful in deciphering the language of a local species.

CHAPTER FOUR

CREW MANAGEMENT

The crew of *Deepnight Revelation* are divided into Divisions, each with responsibility for an aspect of operating the ship or carrying out the mission. Personnel may be borrowed or moved from one Division to another but since specialist skills and experience are required for many tasks the overall composition of the crew will tend to remain stable.

The actions of any crewmember can be resolved by the Referee using the core *Traveller* rules, or abstracted with the system presented here. For routine tasks carried out by a competent crew it is often easiest to assume a normal level of success and move on to the next major event – the Referee is of course free to consider the crew and their actions as 'scenery' and gloss over even quite important matters if they are not interesting or relevant to the storyline.

Large-scale crew actions should be resolved using the resolution system in the previous chapter. In essence this means planning the general outline of what is to be achieved during a Reach, breaking it down into Missions that need to be accomplished and perhaps Mission Segments and Operations if the Mission is complex. Sometimes an entire Reach can be resolved with a single check but this should not be done often. The *Deepnight Revelation* campaign is a journey as well as an adventure upon arrival. Glossing over too much of the voyage detracts from the enormity of the undertaking.

THE CREW

The highest-level tasks are resolved at Crew level. This represents an effort by large numbers of personnel, many of them carrying out minor tasks but ultimately contributing to the success of the task. The overall effectiveness of the crew is affected by many factors. A messy deck hand who forgets to put tools away can detract from the effectiveness of an operation just as a skilled steward who makes sure everyone gets a good meal at the right time helps support morale and ensure the crew's energy levels do not flag at a critical moment.

For example, if the Travellers decide to conduct refuelling at a nearby gas giant, this will normally be resolved at the Crew level as the success or failure of an operation depends on how well the crew work together as a unit.

DIVISIONS

The crew of *Deepnight Revelation* is subdivided into three 'ship' Divisions and an additional 'mission' Division. Many Missions, Mission Segments and Operations are resolved at the Divisional level. For example, if the Travellers order a pair of pinnaces to conduct a survey of a nearby planet, this would be a job for the Flight Division. Their competence will drive the success or otherwise of the task, with the Engineering or Operations crew having little input.

Flight Division is responsible for navigating and piloting the ship, operating its sensors and carrying out any small craft operations such as piloting craft and coordinating their movements.

Engineering Division is responsible for operating the ship's heavy machinery and power plant, its drives and its life support systems. Engineering division also fixes computer and electronic system problems, even if those systems are in use by other Divisions.

Operations Division is responsible for ensuring the smooth operation of the ship as a whole. Its personnel include stewards, administrators, deck hands, maintenance technicians and gunners for the ship's weapons. Aboard a naval ship gunnery would be a separate Division but although *Deepnight Revelation* is heavily armed for a civilian ship her weapon crews are part of the Operations Division and spend most of their time performing other tasks.

Mission Division includes all personnel whose jobs are more about completing the overall mission than operating the ship. This includes scientists, research assistants, mission-related specialises and any 'wild talent' individuals who may have joined the crew.

Teams

It will sometimes be necessary to form a Team to complete a task or determine how a specific group of personnel deals with a situation. For example, the Travellers select a dozen personnel to carry out a detailed planetary survey and provide them with additional pilots and technicians to help. This is a generalist Team. Meanwhile, the ship's life support engineering experts are trying to fix a fault on one of the accommodation blocks.

DIVISION IDENTIFICATION

This is a specialist Team formed out of the Engineering Division. On many occasions the matter could be resolved at the Divisional level but in this case the Referee decides to subdivide since the Travellers are trying to accomplish multiple tasks at once.

CREW EFFECTIVENESS INDEX

The crew and mission experts aboard *Deepnight Revelation* are skilled and determined but do not represent ultimate capability in all areas. Whilst efforts were made to put together the best crew for the task ahead, compromises had to be made. Each additional crewmember added to the volume of supplies that would be required and finding competent people willing to undertake such an immense journey was at times difficult. The crew is as effective as was possible at the time the personnel were assembled but may not be everything the Travellers could want.

Crew effectiveness may vary over time for a number of reasons. Fatigue and casualties can reduce effectiveness, whilst personnel might develop their skills or learn new ones. These factors are modelled by the Crew Effectiveness Indicator or CEI, which is used to resolve many situations that a ship and her crew encounter. It is based on an estimate of the training level and general competence of the ship, modified by leadership and a number of factors arising from events during the mission. These include incidents that will improve or reduce morale, crew disaffection and fatigue.

CEI is rated 0–15 and can go up or down during the voyage. Changes to CEI are long lasting and require major events or great effort. Short term modifications are reflected in the vessel's CEI Modifier. CEI (perhaps modified) produces a DM on tasks undertaken by the crew.

The base level of CEI for a ship is determined by the crew's training and the ability of junior and senior leaders to pull everyone together as a unit. The CEI table shows how crew competency varies with CEI. How it varies on the *Deepnight Endeavour* depends on the actions of the Travellers.

CEI

CEI	Equivalent	Specialist/General Skill Levels	Task DM
0	Barely able to do their jobs, little cohesion	0/0	–6
1		1/0	–5
2	Extremely poorly skilled crew	1/0	–4
3		1+0/1+0	–3
4		1+0/1+0	–2
5	Low quality or poorly trained crew	1+0/1+0	–1
6		2+1/1+1	–1
7	Properly trained naval or merchant crew	2+1/1+1	0
8		2+1/1+1	0
9	Highly trained crew	3+1/1+1	+1
10		3+1/1+1	+1
11		3+1/1+1	+2
12	Elite or veteran naval crew	3+1/2+1	+3
13		3+1/2+1	+4
14		3+1/2+1	+5
15	Legendary crew formed from the cream of veterans and prodigies	4+2/2+2	+6

The Specialist/General Skill Levels column indicates the skill level that could be expected of a typical specialist serving aboard the vessel. The first digit indicates primary specialism such as Pilot (small craft) or Engineer (j-drive). Any additional digit before the slash indicates an additional specialist skill level taken in a different skill. Digits after the slash indicate general skills. For example, an Engineering crewmember whose skills are indicated 2+1/1+1 might have Engineer (power) 2, Engineer (j-drive) 1, Vacc Suit 1 and Mechanic 1.

This indicates the general skill levels of random crewmembers who might be encountered or assigned to do a particular job. For example, a research assistant sent on a mission with the Travellers is from a crew with CEI 7. His skills are rated as 2+1/1+1, with no Task DM. The Referee assumes this crewmember is generally competent and has suitable skills for his role. Specialist skills are assigned as Investigate 2 and Science (planetology) 1. General skills are Vacc Suit 1 and Mechanic 1.

This system does not indicate all skills a crewmember has and is merely a quick indicator to avoid the necessity of detailing every member of the crew.

CEI also applies to other vessels and can be used to resolve many situations. For example, if an alien vessel is trying to ambush the Travellers' ship, the CEI of the two vessels will affect efforts to detect and track one another and how fast each ship reacts when contact is made.

CEI Modifier

Deepnight Revelation's Effective Crew Efficiency Index (ECEI) is used to resolve situations that need to be abstracted. ECEI is determined by applying the CEI Modifier (CEIM) to the crew's long-term CEI. The modifier varies on a constant basis whereas permanent changes to CEI require long periods of training or considerable experience. The latter can result from a successful Reach but should not always be assumed to do so.

Since CEIM begins at +0, ECEI has the same value as CEI at the beginning of the expedition but will frequently vary thereafter. Every time the vessel or crew suffers a tragedy there is a chance the CEIM will change, usually in a negative direction. A tragedy can include one of the following:

- The vessel takes casualties equivalent to 5% of its starting crew.
- A major system such as the bridge, spinal mount or battery of barbettes is disabled.
- A Leadership Crisis occurs (see *Morale* on page 38).
- The ship's commanding officer is disabled or killed, or is thought to have been.

Such events may result in the CEIM changing by –1. To avoid this, the ship's commanding officer must make a Difficult (10+) Leadership check (2D x 5 minutes, INT). If the check is unsuccessful, the modifier changes by –1 and in addition MOR is reduced by a value equal to the negative Effect.

The CEIM may also be changed in a positive direction. To obtain an increase of +1 to the CEIM an event that can cause an increase must occur and the ship's commanding officer must make an Average (8+) Leadership check (2D x 5 minutes, INT). MOR is modified by the Effect of this check and can go down if the event is mishandled.

Events that can increase CEI Modifier include:

- Generous supply and provisioning. This will be rare during the voyage of *Deepnight Revelation*. It is possible the vessel may be able to resupply from a friendly alien race or undertake a major reprovisioning effort as the focus of a Reach. If successful, such an endeavour would allow an attempt to increase CEIM.
- Solid success that demonstrates good practice and reliability of team-mates, such as a textbook rescue of a landing party under difficult conditions.
- A period of well-planned training or exercises lasting at least two weeks. Note that the normal ongoing training aboard a ship is routine and necessary for the maintenance of CEI. The crew need to receive training above and beyond this in order to improve. It is possible that the command crew will decide to halt the progress of *Deepnight Revelation* towards her goal in order to carry out such training. Such an effort could pay dividends later in the voyage or simply be wasted time, depending on how well-planned and executed the operation is. Such a training cycle would be the subject of a Reach.
- A draft of additional or replacement personnel are received. This is only likely if the Travellers befriend an alien race and persuade some of their people to join the mission.

In addition, every 2D weeks *Deepnight Revelation* is progressing with her mission, the crew have a chance to increase or decrease CEIM. They may fall into an effective working rhythm and become more efficient or lose focus and become less competent. The vessel's commanding officer must make a Difficult (10+) Leadership check (INT) and apply the Effect as a DM on the CEIM Changes table to determine whether the crew remains effective.

CEIM Changes

2D+ Effect	Result
0–	Morale collapses (MOR -1D+3) and the crew is near mutiny. CEIM –3
1–2	MOR –1D, CEIM –2
3–4	MOR –D3, CEIM –1
5–8	No change
9–11	The crew gains confidence. MOR +1
12+	Efficiency and morale increase. CEIM +1, MOR +D3

Skill levels of crewmembers are indicated by CEI, although an increase does not necessarily mean that everyone suddenly gains new capabilities. ECEI, which is the result of CEI plus or minus the CEI Modifier simply indicates their current effectiveness as a crew.

For example, a few weeks after leaving port with CEI 7, the Travellers have had some successes and a couple of major setbacks. CEIM is currently –1. This means that Effective CEI is 6 and the Task DM for whole-crew tasks is based on this value. Crewmembers' skills are still those of a CEI 7 crew however. Nobody has forgotten how to do their job just because the crew as a whole lacks cohesion and team spirit.

EFFECTIVE CEI

The term Effective CEI, or ECEI for short, is used to refer to the crew's normal CEI combined with its current Crew Efficiency Index Modifier.

Altering CEI

Crew Efficiency Index is a measure of the skill level and determination of the whole crew. Changes to it reflect large-scale events or require major effort on the part of the Travellers.

Casualties: CEI is automatically reduced by –1 each time the crew takes 25 casualties. A casualty in this case is a crewmember permanently or long-term unable to perform their duties. That could mean death or disablement but if crewmembers decide to leave the ship and set up home somewhere this will have the same effect.

Loss of Confidence: A severe setback, such as a navigational error that requires weeks of backtracking, can reduce CEI by weakening the confidence of the crew. Likewise, a major internal event such as mutiny will leave an atmosphere of mistrust afterwards. To avoid CEI reduction the Travellers must make a Leadership check. This is usually Average (8+) but can be easier or harder at the Referee's discretion. Failure indicates a CEI reduction of –1.

Shakeup: A major change to the crew, such as swapping more than 50 personnel between Divisions, may affect CEI. The Travellers must make an Average (8+) Leadership or Admin check. Success indicates the move was carried out without significant disruption but a negative Effect is subtracted from CEI on a permanent basis.

Critical Systems Damage: The loss of important ship wide systems will affect CEI. For example, *Deepnight Revelation* could lose her main bridge and simply swap command functions to the backup, so CEI would not be seriously affected. However, disablement of the internal communications system or computers would impair crew cohesion. A loss of CEI due to lack of equipment can be remedied by fixing or replacing the affected system.

Experience and Training: Every 2D months the crew becomes eligible for a CEI increase. The Travellers must schedule a period of training and reflection upon experience lasting at least 4D days, accompanied by appropriate reassignments and promotions. A Difficult (10+) Leadership or Admin check is required and the Effect added to a 2D roll. If the result is higher than the current CEI, the exercise is carried off well and CEI increases permanently by +1. There is no penalty if the check or increase roll is failed.

DETACHMENT EFFICIENCY INDEX

The Detachment Efficiency Index (DEI) is used in a similar manner to CEI, for actions involving part of the crew rather than the ship's company as a whole. Any significant segment of the crew can be considered a Detachment; each of the four Divisions (Flight, Engineering, Operations and Mission) is a permanently embodied Detachment, whereas Teams formed to carry out a task are temporary Detachments. The DEIs of the four permanent Detachments are tracked on a constant basis whereas Team DEI is irrelevant once the Team is broken up and returns to its parent formations.

Factors altering the effectiveness of the whole crew apply to its constituent parts. DEI is affected by the CEIM. So, a whole-crew resolution uses CEI modified by CEIM and a Division resolution uses DEI modified by CEIM. There is no DEI Modifier since DEI can vary more quickly than CEI.

Starting DEI for each Division is the same as the ship's CEI but might change during outfitting or the initial phases of the expedition. Thereafter, DEI for each Division is tracked separately and can change according to the same criteria as CEI. If an incident occurs that affects only one Division, the result is applied to that Division's DEI. If the incident affects the whole crew, CEI is affected instead but DEI is not. It is possible that CEI may be lower than the DEI of some or all Divisions. This suggests a breakdown in cooperation within the ship's company and possibly leadership issues. The Referee can use such situations to create adventures and incidents for the Travellers to deal with. In an extreme case the commander of a successful Division might even try to take over a badly led ship, with extensive support among the crew.

The DEI of a Division or Team is subject to the overall CEIM for the vessel as a whole and may be affected by local factors too.

DEI or CEI?

CEI is used for whole-crew actions. DEI is used for the actions of a Division or a detached Team. If a case can be made for both, the Referee should allow the greater modifier to be used.

Altering DEI

DEI is reduced by the same factors as CEI if they occur within that Division rather than the crew as a whole. A change in CEI does not cause a change in DEI – it is possible for the crew as a whole to outperform each of the departments on its own but even so Division DEI is used for that Division's specific tasks.

Divisional Training: DEI can be increased by training, which does not need quite so much time or planning as a whole-crew exercise. If an entire Division can be released from duty over a period of 4D days – with skeleton crews at critical points on a rotating basis – then training can be undertaken at any time rather than only every few months as with CEI. The same process is used; a Difficult (10+) Leadership or Admin check is required and the Effect added to a 2D roll. If the result is higher than the current DEI, the exercise is carried off well and DEI permanently increases by +1. There is no penalty if the check or increase roll is failed. The Referee should not allow Travellers to abuse this system – training a single Division requires quiet time with the Division's work largely done by other personnel. It is possible to set up an effective training regime this way and achieve a high DEI in each Division but it is not possible to do so whilst conducting exploration or making a fast transit. The crew has enough to do at these times without standing down a quarter of the ship's company for training.

EXTREME MEASURES

In an extremely bad situation, the crew of *Deepnight Revelation* may be able to take extreme measures. This represents heroic efforts, potential self-sacrifice and possibly using equipment beyond tolerances until it breaks down completely. Extreme measures are whole-crew or at least large-scale efforts and cannot be resolved by a Traveller's skill check.

If a suitably dire situation exists, a Traveller can call for extreme measures. This does not have to be the ship's captain, although someone who commits the whole ship's company to a desperate act will have some explaining to do if it was not condoned by the command crew. The Traveller must make a Difficult (10+) Leadership check to inspire such an effort. The Esteem (see page 40) of the crew towards this individual will be important here. A positive Effect allows the Traveller to assign that many points of DEI or CEI to the task they choose.

Each point of DEI assigned to a task adds DM+3 on all checks to accomplish the task, including those made by people outside the inspired group if their efforts would help. Each point of CEI assigned allows an attempt to overcome a near-impossible problem. This does not allow the Travellers to invent time travel or wish an enemy out of existence but almost any physically possible task can be attempted and almost any problem circumvented. However, this comes at a price. All points of DEI or CEI applied to the task are lost at the end of it. This reduction in CEI or DEI is permanent and represents exhaustion, depletion of resources and the sacrifice of crewmembers to get a necessary job done.

Extreme measures will usually impose casualties on the crew equal to 1D per point of DEI or CEI applied to the task. The Referee may reduce or waive this if it seems inappropriate. Losses fall upon the involved Divisions as determined by the Referee.

For example, *Deepnight Revelation* is stranded with a crippled jump drive. The drive cannot be repaired without key components that are not available. With no other options her commanding officer and chief engineer decide to take extreme measures. The Leadership check comes up with Effect +3 so the captain decides to use 1 point of CEI and the Chief Engineer spends 2 points of DEI from their Division.

The CEI point buys a chance to create a workaround that will allow the drive to function without the required components. The DEI points are applied to the Engineering Division's attempt to complete the task. The crew cannot afford to fail, as a second attempt would require another CEI point to allow a new workaround to be attempted.

Deepnight Revelation at this time has CEI 9, giving overall DM+1 but her Engineering Division has been trained to a hair and has DEI 11. This gives DM+2, which the Referee decides should be used as this is an engineering problem.

Fixing the jump drive with the wrong components is deemed by the Referee to be a Formidable (14+) task, which is only possible at all because of the whole-crew effort to find a solution. With DM+1 for their well-trained crew and DM+6 for the expended DEI points, the Travellers' roll of 8 becomes a mighty 15. They have succeeded but at a terrible cost.

2D casualties are imposed on the Engineering Division and 1D on the general crew. Some of these people were maimed or killed in accidents and the effort only succeeded because an engineering officer and his team activated the drive from inside its casing. Their remains are forever part of *Deepnight Revelation's* drive; just one more heroic story of many on this mission. In addition, a lot of equipment was cannibalised and some broke down. CEI drops from 9 to 8 and the DEI of the Engineering Division is reduced by –2 from 11 to 9. However, *Deepnight Revelation* is still flying.

EXTREME MEASURES

Extreme Measures can be used as a means to get the Travellers out of serious trouble. For example, if they have managed to become trapped in a star system with no fuel available the voyage would normally be over. However, if the Travellers can come up with some way of locating a fuel source – perhaps an icy rogue comet in a highly elliptical orbit – they should be allowed to try. The attempt comes at the price of long term capability, so the Travellers cannot afford to rely on extreme measures to get them out of every tricky situation.

FORMING A TEAM

A detachment of the ship's company sent to carry out a specific job is referred to as a Team. Both Divisions and Teams are detachments but Teams are temporary and will be dissolved back into their parent Division or the crew as a whole at the end of the job.

Typically, a Team uses the best personnel who can be spared rather than the best available, unless the task is critical. For example, the mission's lead scientist would not normally be pulled away from an ongoing research task to investigate an unusual rock formation. However, bad decisions are sometimes made or there might be a reason why critical personnel have to be pulled from their posts.

When any Team is formed, its DEI is based on the DEI of whatever Division it is pulled out of, or the ship's CEI if the Team is put together from a mix of personnel. This value is modified by the results of the following process:

The officer forming the detachment must make a Difficult (10+) Leadership check. The Effect of this check is applied to the total modifier. In addition, the size of the detachment and personnel pool available to form it will affect the amount of suitably competent crewmembers available.

Detachment Size

Size of Detachment	Modifier
Less than 1% of available personnel	+2
1–5% of available personnel	+0
6–10% of available personnel	–2
11–20% of available personnel	–4
21–30% of available personnel	–6
31–40% of available personnel	–8
41–50% of available personnel	–10

If more than 50% of the available personnel are detached, the situation is subject to special rules. See *Weakening the Ship's Company* on page 37.

The Effect of the Leadership check and modifier for detachment size are totalled, along with any of the following that apply and used as a modifier to a 2D roll on the Total DEI table.

Put Our Best People On It: If the decision is made to create the most effective team possible; even if this weakens the parent Division, DM+3 applies. However, see page 37 for the negative effects of this.

Send Anyone With a Pulse: If the task is of low importance or the ship's company cannot spare well-qualified people, a deliberately weak detachment might be created. If so, DM-3 applies.

A detachment pulled out of a Division uses its DEI as base; a detachment of the ship's company sent off as a landing party would use the CEI of the ship or the DEI of the Crew Division, as appropriate.

Total DEI

2D	DEI
0 or less	CEI/DEI-2D3
1–2	CEI/DEI-1D
3–4	CEI/DEI-D3
5–6	CEI/DEI-1
7–8	CEI/DEI+0
9–10	CEI/DEI+1
11–12	CEI/DEI+D3
13 or more	CEI/DEI+1D

Note that it is quite difficult to create a Team that is more competent than a parent Division but it can be done. This reflects sending only the absolute best personnel and allowing them to stand out from the average competence of their crewmates.

WEAKENING THE SHIP'S COMPANY

The ship's company can be weakened by several circumstances and under-manning, casualties or a need to send off parties for various tasks can leave a ship dangerously understaffed. Whenever the ship's company or a detachment (Division or Team) is subject to any of the circumstances below, it is potentially weakened.

- When a detachment is formed from a parent body.
- When casualties are taken in combat or by other means.
- When sufficient personnel are unavailable for their normal duties due to needs elsewhere.
- When the ship's company or a detachment is not experienced at working together.

Whenever circumstances arise that might weaken the ship's company or a detachment, the officer commanding it must try to avoid a reduction of capabilities by making an Average (8+) Leadership or Admin check. The Effect of this check is added to the following modifiers and a 2D roll is made on the Weakened Detachments table.

Use the following modifiers.

If an 'A-team' detachment was formed	+2
If a deliberately weak (low-skills) detachment was formed	–2
Casualty percentage or detachment size is less than 1% of crew	+0
Casualty percentage or detachment size is 2–4% of crew	–1
Casualty percentage or detachment size is 5–9% of crew	–2
For each additional 5% casualties or otherwise lost personnel	–1
If the crew or detachment have common training but little experience of working together	–2
If the crew or detachment do not have common training	–4

TRACKING CASUALTIES

Deepnight Revelation started her voyage with just under 500 active personnel aboard. The Referee will need to track current crew status in terms of surviving personnel, remembering there could be some 'spares' carried in low berths to bring the crew back up to size. These are more likely to be moderately skilled generalists than experts in a field but sometimes extra hands are more important than knowledge.

Every five casualties taken or personnel sent off to do a job represents a reduction of 1% in the strength of the ships complement. Routine matters like sending a party planetside to explore do not weaken the company – these personnel are still available even if they are a shuttle ride away. However, if a party is cut off or lost this will weaken the ship's complement. How many times can the Travellers afford to lose 20 personnel in a groundside disaster? The Referee should track the ship's current complement and ensure the Travellers are aware of the effects of losing people. Crewmembers are not expendable on a mission where they cannot be replaced.

Weakened Detachments

2D	Effect on DEI or ECEI
0 or less	–4
1–3	–3
4–6	–2
7–9	–1
10–12	+0
13 or more	+1

It *is* possible to increase efficiency by losing some crewmembers but more commonly, even after a reshuffle of personnel, the detachment or crew will be less effective than before.

MORALE

Morale (MOR) is a measure of the determination and psychological resilience of a ship's company. For *Deepnight Revelation* MOR begins at a high value since all (or at least most) crewmembers are highly motivated volunteers. Starting MOR for *Deepnight Revelation* is CEI+2D3. For ships encountered along the way MOR can be determined using the Starting Morale table.

Starting Morale

Vessel Type	Starting MOR
Naval Warship	CEI+1D
Naval Auxiliary	CEI+D3
Merchant Line Vessel	CEI+D3
Paramilitary Vessel or Corsair	CEI+1
Independent Vessel	CEI+0

MOR is rated on the same 0–15 scale as a Traveller's characteristics and creates a DM in the same way. It is used instead of CEI to resolve situations affecting the mood of the crew.

MOR varies a lot more than ECEI. A wise captain does as much as possible to maintain the morale of the crew but it will be worn down over time by setbacks and fatigue. Some events alter MOR directly, while others require a MOR check.

Morale Checks

There are two common types of MOR check and both are carried out the same way. The usual MOR check is Average (8+) but the difficulty can be higher or lower if the situation is particularly grim or encouraging.

A minor MOR check imposes MOR–1 if failed.
A major MOR check imposes MOR–D if failed.

If not otherwise specified, a MOR check is assumed to be minor.

Leadership Crisis

A Leadership Crisis takes place at any time MOR drops by three or more points in the same event and when the head of a Division (such as the chief engineer), the captain or executive officer is put out of action without a clear replacement. This might occur if the ship's communications are down and orders are desperately needed even if the officers are still alive.

Dealing with a leadership crisis requires a Traveller to take direct and effective measures to remedy the situation or reassure their crewmates. It is not necessary to completely fix the problem but the Traveller's actions must make it seem things are not so bad as they look. An inspiring speech could work or the Traveller might present a workaround that will suffice for the time being. An appropriate skill check (usually Leadership but possibly Persuade or Diplomat) will permit a Traveller to avert the crisis. The check will normally be at Average (8+) difficulty. Failure indicates the ship's CEIM is reduced by the negative Effect and in addition CEI is reduced by –1.

For example, communications with the bridge are cut off and a rumour flies around that the command crew are all dead. Crewmembers abandon their tasks in panic and despair. One of the Travellers yells out, 'Would the captain want us to lose the whole ship just because she's down? Do your jobs, people!'. He begins bodily shoving crewmates back to their positions. This in-your-face approach calls for a Leadership check and possibly some personal violence.

As another example, morale plummets due to an incident and a mob gathers in the mess hall. Grumbling turns nasty and there is a real danger the crew will completely lose faith in the command team. The Travellers distract the crew by setting off a fire alarm, dispersing crewmembers to their emergency posts. Whilst everyone is breaking out firefighting gear the Travellers have a quiet word with a few of their crewmates, persuading some that things are not as bad as they seem and giving others a reason to stop causing trouble. This piece of misdirection requires a Persuade check and, again, perhaps some personal violence.

PRAISE THE LORD AND PASS THE AMMUNITION!

According to a popular song of the mid-20th Century, those words were said by a US Navy chaplain during the bombing of Pearl Harbour. With anti-aircraft gunners down and the crew on the verge of panic, the chaplain manned a gun himself and shouted the now famous exhortation. In fact those words were said but under slightly different circumstances. Still, the incident stands as a marvellous example of how a junior crewmember can head off a leadership crisis by taking decisive action – and maybe coming up with a good slogan.

Events Affecting Morale

Morale can be affected by a number of events and circumstances, some positively but most negatively. A separate MOR check must be made for each situation that occurs. The following are examples; many other possible morale-affecting incidents could occur.

Deliberate Action: Most deliberate attempts to influence MOR are positive, such as the captain touring the ship, praising the crew and listening to their concerns. Rabble-rousing on the part of disaffected crewmembers can reduce MOR. Efforts like this normally take a day or two and require the use of skills such as Persuade or Leadership.

Hardship: A crew forced to suffer hardship for an extended period must make a minor MOR check. Hardship in this case might mean being forced to live in very cramped quarters or on short rations, either due to supply difficulties or damage to the ship.

Injustice: If the crew perceive injustice, such as being punished too harshly for infractions or rules applied unevenly, a MOR check is required. This will normally be minor but an incident like the summary execution of a popular shipmate might require a major check instead.

Liberty: *Deepnight Revelation* will have limited opportunities for crew liberty but the crew will expect an occasional chance to get out of the ship on a habitable world. This may lead to misadventures or unexpected dangers but the morale effects of getting time away from the ship (or being denied it) can be significant. If the crew is given severely restricted or no planetside liberty where normally expected, a minor MOR check is necessary.

Severe Danger: The crew of *Deepnight Revelation* have accepted a certain degree of risk in their duties and under most circumstances would not be unduly upset by the prospect of danger. However, if ordered into severe danger the crew must make a major MOR check if the action seems unnecessary or a minor MOR check if there is a clear reason why the risk is warranted.

Success: Morale thrives on success. If the command crew can provide the ship's company with a clear goal and proof it has been attained, MOR may increase by +1 or occasionally more. The goal must be something worthwhile and probably difficult, such as making repairs in a very short time or witnessing a wondrous spectacle. Escaping from a bad situation can also improve MOR.

Weak Leadership: A crew with cause to doubt the competence of its officers, or who witness a challenge to the authority of the commanding officer, a department head or some other important figure, must make a MOR check. This will be minor in the case of a small challenge but an incident such as a brawl among senior officers might require a major MOR check.

TRAVELLER ESTEEM

How well a Traveller is regarded by his crewmates can have serious implications. A Traveller highly respected with a good reputation for steadiness in times of danger is more likely to be heeded when they utter a dire and bizarre warning than one thought of as lazy and inept. Likewise, being held in high regard makes it more likely that subordinates will obey orders or follow suggestions, lend a hand when needed and part with prized objects if the Traveller asks. The converse is also true.

Esteem (EST) is a measure of the relationship the Travellers have with other members of the expedition and should be tracked separately for each Traveller. It imposes a DM on all checks to interact with other members of the crew, in addition to the usual skill and characteristic DMs. However, EST is a guideline only; a high EST suggests the Traveller is generally well thought of but there may be some among the crew who despise them as a result of incidents or interactions.

If a Traveller has a relationship with a particular crewmember that differs from that indicated by their EST, then the specific relationship takes precedence. For example, a Traveller might have comprehensively destroyed their EST except with one scientist who still believes in them. Interactions with this individual should be guided by the established relationship rather than EST, although the scientist will probably be mindful of what the rest of the crew will think.

EST begins at Average and is not affected to any significant degree by minor interactions. The DM noted on the Esteem table is applied to all interactions with the crew unless the Referee decides otherwise but not to the Check to Achieve. The Check to Achieve column indicates the difficulty of a check to attain (or fall to) that level of EST. It is relatively easy to change opinions in the mid-range but becoming a hero to the crew is more difficult. Likewise, extremely low opinions are difficult to cause and maintain, although there are those who can manage it.

Each Traveller has a chance to increase or decrease EST at the end of a Reach and there may be occasions where additional checks are made. All checks are simple 2D rolls, with no skill or characteristics applying. Other DMs may be applied by the Referee, depending on the actions of the Travellers. For example, if *Deepnight Revelation* only narrowly escaped destruction because the Travellers made a stupid mistake, a DM may be applied to make a drop in EST more likely. Heroic efforts to help others or save the ship might garner a positive DM. However, the Referee should be aware that everyone aboard the ship is a highly skilled participant in a great undertaking; actions that would seem amazing elsewhere may be little out of the ordinary in this environment. The Travellers should not be heroes to the crew within a few months of leaving port; such status requires a string of impressive successes and the occasional great deed.

For example, a Traveller regarded with EST Average impresses her colleagues by taking charge of a complex damage control situation and saving lives. The Referee decides this is well worth an EST increase check at the end of the current Reach and rules that DM+2 applies

Esteem

EST	DM	Notes	Check to Achieve
Despised	–4	The Traveller is ostracised and tends to be blamed for every mishap even if it is not their fault. Their inclusion in a team reduces morale.	Very Difficult (12+)
Very Poor	–3	The Traveller is considered a liability who weakens the ship's company considerably. Nobody wants to work with them.	Difficult (10+)
Poor	–2	The Traveller is seen as a weak link but if they are trying hard they are worth supporting and helping to improve.	Difficult (10+)
Below Average	–1	The Traveller is seen as underperforming but within tolerable limits.	Average (8+)
Average	0	The Traveller is about as well thought-of as anyone else aboard.	Average (8+)
Above Average	+1	The Traveller is well regarded but nothing out of the ordinary.	Average (8+)
Good	+2	The Traveller is seen as a solid, dependable comrade who others will come to for help.	Difficult (10+)
Very Good	+3	The Traveller is a leader among the crew whatever rank they hold and instrumental to the mission's success.	Difficult (10+)
Excellent	+4	The Traveller is little short of a hero among the crew and one of the de facto leaders of the expedition even if they do not hold high rank.	Very Difficult (12+)

since the Traveller's actions prevented injuries and deaths. However, she normally does not trouble herself to get involved with anything not specifically her job, which some colleagues resent. This is worth an EST reduction check with no DM at the end of the Reach. Both checks are Average (8+) difficulty. The Traveller passes the positive one and fails the negative, so the net effect is an increase of one level to EST Above Average. Some crewmembers have reservations about the Traveller but they know she can be relied upon in an emergency even if she is a bit lazy the rest of the time.

CREW FATIGUE

In an extremely long voyage like this one, crew fatigue will be a serious factor. Even the most highly motivated crew will become fatigued by long weeks cooped up in a starship, especially during a long, fast transit where there is nothing out of the ordinary to pique the crew's interest.

At first, fatigue manifests as listlessness, a tendency to be fractious and general inattention to details, all of which can be fatal aboard a starship in deep space. Fatigue can cause otherwise excellent crewmembers to neglect their duty or get into pointless arguments with superiors, in turn creating a discipline problem. In extreme cases, it could lead to fights among the crew or even mutiny.

Fatigue is one of the hidden 'drivers' of the campaign, forcing the Travellers to take action and go places they might not have wanted to. It can be used as a subtle plot device, with an otherwise competent crewmember making dangerous mistakes that lead to interesting situations or create a change of pace with a 'space crazy' crewmember running amok or locking himself in a vital compartment. In this case, the onset of fatigue should be a scripted event, with the Referee implementing it at a plausible time.

Alternatively, fatigue can be used as a 'clock' for the mission, forcing the Travellers to remain mindful of their crew's resilience and influencing decisions. Just as a wise captain is always aware of the fuel and supply situation, they will also want to know about the crew's state of mind and try to keep fatigue to a minimum. If the Referee uses fatigue effectively, it will become another factor in decisions made by the Travellers. Eventually, they will cease doing the most effective thing possible to get the biggest DM on resolution rolls and start accepting compromises. The least-bad-of-available-bad-options may be acceptable as the price for avoiding trouble later in the voyage.

Fatigue is tracked for the crew as a whole and can also be recorded for key individuals – including the Travellers. If they try to behave like superhuman efficiency machines, the Referee can impose fatigue upon them and watch their effectiveness degrade as the mission goes on.

Fatigue is tracked using the Crew Fatigue Index (CFI), and Individual Fatigue Indexes (IFI) if the Referee so chooses. CFI starts at 0 and may increase at intervals during the voyage. It may also be reduced by appropriate actions on the part of the Travellers.

CFI begins at 0 after an occasion where the crew can rest and relax for a significant time, such as at the beginning of the voyage or if they have been able to spend a few weeks at a friendly alien port. After an initial period, the CFI increases by +1 and continues to increase at intervals afterward. Each time CFI is increased, the Referee should determine if the crew as a whole, or a targeted individual if appropriate, has become Fatigued with a 2D check.

The crew of *Deepnight Revelation* were selected as far as possible to be resilient to fatigue and their dedication to the mission is also a factor. They will inevitably become Fatigued, however, unless measures are taken to prevent it.

Fatigue Intervals

Circumstance	Interval
Initial Interval After Period of Rest	10D Days
Standard Interval	6D Days
Tiring or Stressful Period (such as transit through a dangerous region under constant threat of attack)	4D Days
Highly Stressful or Tiring Period (such as constant running repairs needed during a transit)	2D Days
Overly Cramped Accommodation	–1D Days
Generous Accommodation	+1D Days
Reduced Supplies or Bad Food	–1D Days
Luxuries	+2D Days

On average, CFI will increase to 1 around 35 days after leaving port and by +1 every 21 days thereafter, assuming normal supply availability and no undue long-term stress factors. Subsisting on barely edible food will increase fatigue faster, as will having too many personnel jammed in together. Conversely, if the ship has managed to source large amounts of fresh food – even frozen will still be better than standard rations – or additional luxuries for the crew, the onset of fatigue will be slowed.

The Referee may impose modifiers on the fatigue check to avoid becoming Fatigued, depending upon circumstances. Lousy food leads to rapid disaffection, as does an 'entertainment' facility containing nothing but interactive maintenance manuals and operas in six Vargr dialects.

Becoming Fatigued

To avoid becoming Fatigued, it is necessary to roll equal to or over the current CFI or IFI. For individuals, a DM may be applied equal to their highest shipboard skill (such as Pilot, Astrogation, Engineer, Gunner and Steward) to represent experience with dealing with shipboard life. When rolling for the crew as a whole, the DM associated with the current ECEI is used. If the check is passed, there is no effect, although grumbling is a way of life for some crewmembers.

If the check is failed the crew (or individual) has become Fatigued and will at least be difficult to live with. This is not the same as merely being tired; the affected crewmembers have become uncomfortable aboard ship and disaffected with the whole experience. This cannot be cured by a good night's sleep. It is possible to reverse the effects of Fatigue – see *Defatiguing* on page 44.

USING FATIGUE

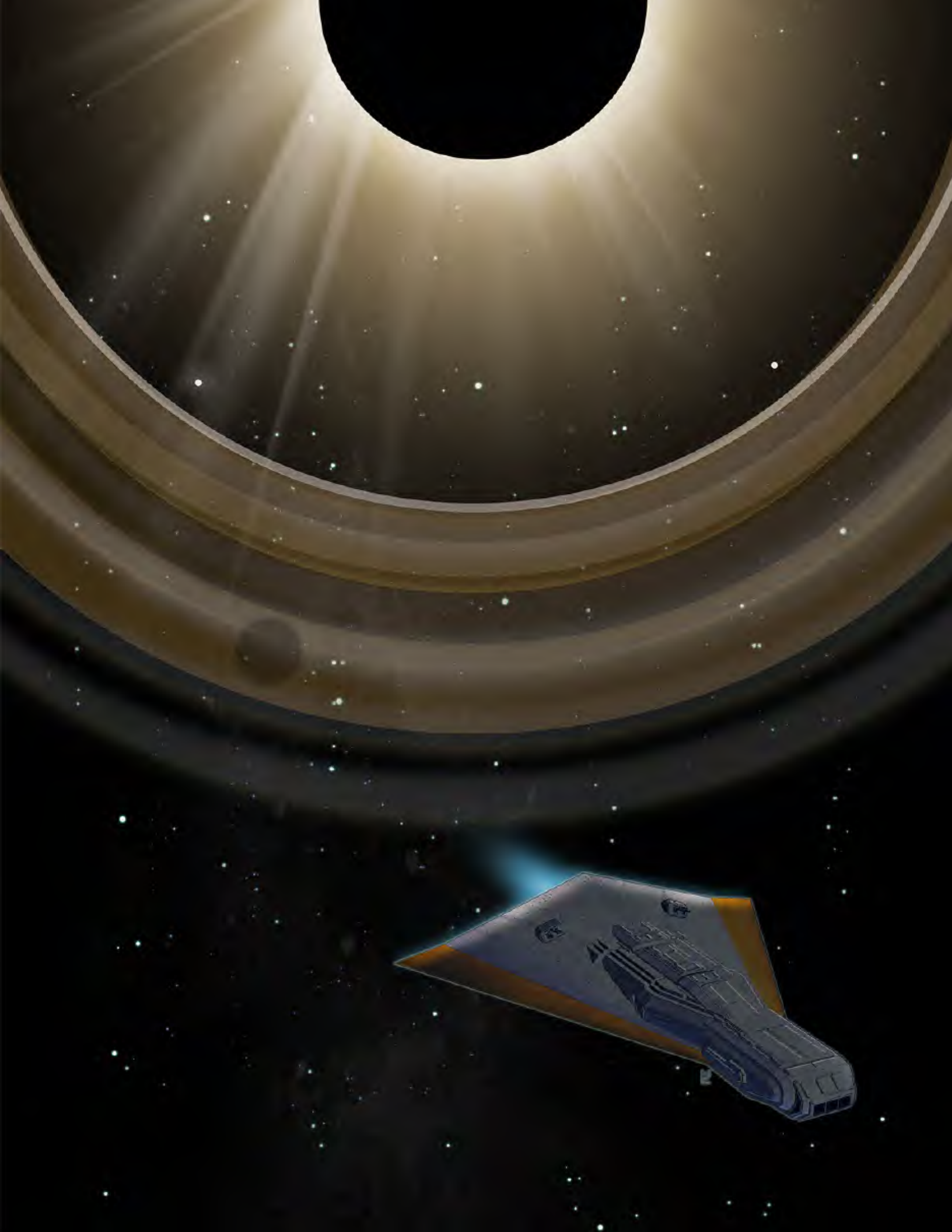
It may seem desirable to dispense with the Fatigue rules, as they make everything harder for the Travellers. However, not only is this realistic but it adds another dimension to the voyage, as the Travellers have to plan for rest stops and find ways to defatigue the crew. This in turn can create adventure opportunities. Why would the Travellers be so stupid as to get caught by an emergency with half their crew planetside on an apparently safe and inviting world? The Fatigue rules require the Travellers to make compromises – do they forge ahead and accept the gradual exhaustion of the crew? Spend long periods rotating small numbers of personnel planetside under heavy guard? Or do they accept the apparently minor risk of a mass recreation break that lets the ship get underway sooner?

A Fatigued crew will show obvious symptoms but dutifully attempt to carry out their tasks to the best of their abilities. If CFI or IFI continues to rise, checks to avoid becoming more Fatigued are made each time it increases. The same system is used – the crew must roll equal to or higher than the current CFI or IFI to avoid becoming more Fatigued. As Fatigue increases the crew suffers an increasingly severe negative DM as their symptoms become worse. Fatigue can increase in stages until the crew are so exhausted they cannot function properly. Mutiny is likely at this point, if not before.

In addition to the DM applied to all tasks, it is possible for Exhausted or Incapable crewmembers to suffer a breakdown. At the Referee's discretion, an END check

Effects of Fatigue

Fatigue State	Effect	DM
Fatigued	The crew are noticeably off their game and tend to be bad-tempered with one another.	+0
Highly Fatigued	Performance is significantly reduced and 'interpersonal incidents' are commonplace.	–1
Dangerously Fatigued	Crewmembers are likely to neglect some less important (as they see it) parts of their duties. MOR-1.	–2
Exhausted	Crewmembers may directly refuse to carry out some tasks and are prone to serious lapses of judgement. MOR-D3.	–3
Incapable	The crew are close to mutiny and have reached the point where even a simple task can go badly awry. MOR-1D.	–4



should be made whenever a crewmember is asked to undertake a difficult, complex or dangerous task. The difficulty of this task is Average (8+) but the fatigue DM from the Effects of Fatigue table applies.

If the check is passed the crewmember can carry out the task to the best of their reduced ability but if it is failed they suffer a breakdown or become dangerously incompetent. All skill checks are increased by one level of difficulty in addition to the existing Fatigue DM, so an Average (8+) task becomes Difficult (10+). Failing the END check with Effect –6 or worse means the crewmember has suffered a breakdown. They may become aggressive towards other crewmembers, so depressed they cannot perform their duties or otherwise are a menace to the ship and her crew.

Defatiguing

CFI can be reduced by various means. Each time CFI is reduced, a check can be made to see if the crew's Fatigue level goes down. The same process is used for decrease as increase – rolling equal to or greater than CFI or IFI on 2D results in a reduction of one level of Fatigue. CFI increases inevitably as the expedition proceeds but requires deliberate actions to reduce it. This must be factored into the Travellers' plans or they will eventually meet with disaster.

For individuals, getting out of the ship for a significant time (at least a day), in a port or roomy space station such as an orbital starport, will reduce CFI or IFI by –1. A CFI cannot be reduced in this manner unless the ship rotates large numbers of personnel through portside liberty over the course of a few days. There are, however, other options.

Change of Pace: If the Travellers provide the crew with a significantly different activity to their normal routine, Fatigue may be reduced. A change-of-pace activity will typically require the ship to remain in-system for 2D days without undertaking maintenance, research or other mission tasks. At the end of the period the Travellers can make an Average (8+) Leadership check and if successful CFI is reduced by one. Examples include:

- Undertaking a period of not very demanding training that takes crewmembers out of their usual roles and allows them to both have new experiences and succeed in mildly challenging tasks.
- A simple 'work stops' period, in which crewmembers are encouraged to invent sports to play in the cargo hold, catch up on lost sleep, hold parties or otherwise enjoy a holiday from the endless routine of shipboard life.
- A planetside activity can be turned into recreational activity if properly handled. Not everyone likes to hunt for meat but there are plenty of ways teams of crewmembers can blow off steam whilst gathering supplies on a breathable-atmosphere world. Inventive Travellers can convince their crewmates that necessary (and often hard) work is fun, especially if it means doing something different away from the ship.

There are many other ways the Travellers can give their crew a break or change of pace and thereby reduce Fatigue. However, desperate danger does not count towards defatiguing! Fighting off an attack by alien starships might be a break from routine but it is hardly restful.

A Successful Undertaking: An unusual (or unusually difficult) undertaking can be used to reduce Fatigue if properly handled. At the end of a suitable task the Travellers can make a Difficult (10+) Leadership check and reduce CFI by the Effect if successful. A failed check has no impact on CFI. This assumes the Travellers take the time to celebrate the endeavour and reward particularly deserving individuals. Examples include:

- The ship needs significant repairs and the Travellers exhort the crew to make unusually intense efforts to complete them in record time or make do without some components. After planning and executing several Missions the Travellers declare success and celebrate with the crew.
- The Travellers make a fast transit through the next few star systems. This results in a shorter interval between CFI increases but if successfully completed the crew can celebrate a job well done with a couple of rest days and ship-wide celebration.

Wonders: If *Deepnight Revelation* is in a position for her crew to witness something wondrous and the Travellers take the trouble to ensure the whole crew gets to experience the spectacle, CFI is automatically reduced by –1. Exactly what constitutes a 'wonder' depends on the Referee's judgement. Some things are incredible every time, some just once and some may be presented as special even if they are not really all that amazing. Note that some spectacles may be frightening yet still reduce CFI – the crew of *Deepnight Revelation* signed on to see such wonders. Examples include:

- A space-dwelling creature flying alongside *Deepnight Revelation* or a group of them sporting in the rings of a gas giant.
- A wonder of physics such as a black hole, complex multi-star system or collision between two moons.

- A lesser wonder such as a particularly gorgeous ring system lit by multiple stars, ancient carvings on an airless moon, incredible animals or the ruins of an alien civilisation.

Rest and Recreation: The most obvious way to reduce CFI is to rest at a suitable place. This might be a friendly alien starport or habitable world that allows an extended stay groundside. If the whole crew can be stood down, with skeleton watches in place and everyone getting a fair share of the downtime, CFI is reduced by –1D every three days. CFI is reduced by –1 every seven days if the ship is kept at a higher level of readiness. This assumes the Travellers are guests of a friendly alien race who have good recreation opportunities, ranging from strangely familiar starport bars to museums of their fascinating history. If the crew is forced to rely on their own devices, such as basic facilities created by moving the ship's recreation equipment planetside on a habitable world, the reduction is –D3 every 2D days, or every 3D days if the ship is kept at a more than minimal level of readiness.

Once CFI reaches zero, all levels of Fatigue are eliminated. If the Travellers add an additional period of rest equal to at least 2D days, the crew are fully refreshed and perhaps even eager to move on. CFI does not begin to increase until a new initial period has passed, just as when the crew first left their home port.

A break of this sort 'cures' all Fatigue effects except a breakdown. A crewmember in such a mess that they cannot perform their shipboard duties will not recover over the course of a week's holiday. Instead, they will improve to some extent but retain quirks and potentially dangerous habits (such as not caring much about pre-flight checklists) which can only be 'fixed' by therapy or some solution devised by the Travellers.

Other Measures: The Travellers may come up with all manner of inventive ways to reduce Fatigue. Some might be rather questionable, like using shuttles to nudge asteroids into collision just to see what happens, or converting part of the cargo hold into a sculpture commemorating the mission's achievements. Perhaps the Travellers might build an improvised musical instrument made out of trash and broken components. The Referee should evaluate such endeavours in the light of a self-contained community years from home and any help if they suffer a disaster. Behaviour that would seem crazy at the start of the mission might become normal, or even necessary, to cope with the stresses of such a long voyage.

Note that most attempts to reduce Fatigue are based on the Leadership skill. However, the Travellers might make a case for using other skills. An epic banquet or celebration might be based on Steward or Carouse; the creation of the *Deepnight Revelation* Olympic Games might use Admin or Athletics depending on how the Travellers go about it. The Referee should consider any attempt to keep up morale on its merits but the Travellers should never be allowed to simply create a set of standard Fatigue-fixes and make them routine. The constant battle against boredom and ennui are part of the voyage and the Travellers' increasingly bizarre efforts should become part of the story.

Chronic Fatigue Syndrome

Chronic Fatigue Syndrome (CFS) is a recognised mental illness and one which naval doctors are careful to monitor. Some personnel are more prone to fatigue than others and some do not recover as quickly when rest or diversion is available. A CFS sufferer may try to 'keep it together' and do their job, and may manage to conceal their symptoms, or go undiagnosed by inattentive medical staff.

CFS is grounds for removal from a position of authority, so officers are usually sensitive to accusations they are suffering from excess fatigue. Crewmembers who have not been spotted in time may 'crack' at a dangerous moment, adding to the Travellers' troubles. The breakdown may be graphic, with a crewmember leaping up from their station and running around the ship screaming, but far more often it is insidious. For example, a highly experienced pilot develops a deep fear and insecurity about their abilities and may freeze during a hazardous docking manoeuvre or ignore an order because they are too scared of what might go wrong when they try to come alongside an alien wreck in a 75,000-ton cruiser. An inventive Referee can use CFS in a number of ways, creating complications or wholly new adventures as the Travellers try to sort out the mess caused by crewmembers with CFS or deal with their own.

C H A P T E R F I V E

RESOURCE MANAGEMENT

Resources – or the lack of them – are a driving factor in the *Deepnight Revelation* campaign. The need to find necessary resources may lead the Travellers into all manner of adventures, perhaps forcing them to take actions they know are risky or would have chosen to avoid if the opportunity existed.

Fuel is an obvious consideration when planning a Reach or Mission. Without refuelling, *Deepnight Revelation* will be stranded and her crew doomed to a slow death. Keeping track of fuel is straightforward and requires no special rules, and refuelling can be performed by the usual methods of gas giant skimming or cracking water (or ice) into hydrogen and oxygen.

Spares, stores and supplies, on the other hand, present more of a problem than conventional operations. A vessel will typically enter a starport at least every few weeks, whilst naval vessels are often supported by supply ships. For *Deepnight Revelation,* the situation is quite different. She may not enter a friendly port for years. What she cannot carry, she must fabricate. What she cannot fabricate, she must do without.

The ship has been fitted with equipment to allow small-scale production of necessary items, providing raw materials are available, and synthesis of food from basic materials. Highly efficient recycling also stretches existing supplies much further than aboard a vessel that expects to make port regularly. Nevertheless, there is no way *Deepnight Revelation* can complete her voyage without resupplying from local resources.

Supply Units and Specialist Materials

Stores, spares and supplies are abstracted as Supply Units or SU. Note that supplies are separate from expendable large ordnance such as missiles or fuel for the power plant and jump drives, and represent food for the crew as well as replacement parts for the ship. SU are used on a daily basis and must sometimes be expended to complete a task.

Deepnight Revelation has been ingeniously modified to carry far more spares and supplies than other ships, by using every possible corner of the ship as storage space. Some lockers and bunkers are easily accessible but most are inconvenient at best. However, a policy of moving stores out of these areas into ready stowage as space opens up ensures necessary items are available most of the time. Occasionally, it will be necessary to search for an obscure or rarely used item, and bad record-keeping will result in ship-wide searches for desperately needed spares at the most inopportune moments.

The ship's stowage capacity is much greater than that of an equivalent ship in naval service but her supply requirements are also higher. The needs of keeping a ship operational without starport visits and regular dockside maintenance increases the consumption of supplies, offset by advanced recycling and the ability of a dedicated crew to operate in a very lean supply situation. Assuming nobody is routinely going hungry and there are no plans to skimp on maintenance, *Deepnight Revelation* requires 1,000 SU per day. This is an average and applies whether she is in jump, undertaking exploration work or sitting in orbit around a world. No supplies would be used if the ship was in port – unless the port authority cut off deliveries for some reason – but this is not a likely circumstance on a voyage beyond Charted Space.

Deepnight Revelation can carry 200,000 SU in her internal stowage areas without using any cargo space. If correctly packaged and stowed, additional supplies can be carried in cargo space (or other spaces converted for the purpose) at a rate of 100 SU per ton. Bulk supplies have to be broken out and moved to accessible stowage before use but it is possible to cram cargo bays and other spaces full of supplies before a long Reach. Any area used to store supplies will be inaccessible until they are used or moved out.

At full capacity and normal rate of consumption, *Deepnight Revelation* has an endurance of 200 days using internal stowage only. This roughly correlates with the point where the crew would become incapable of operating the ship properly due to fatigue. It is thus envisaged that reprovisioning should take place at intervals, along with rest periods and maintenance halts. A variety of possible methods are available to obtain supplies, with varying degrees of efficiency. These are discussed on page 50.

Specialist Materials are tracked separately to supplies, as they are less common and required in smaller quantities. There are three types of specialist materials:

Rare Materials are metals and minerals required for purposes ranging from component fabrication to creating superdense materials to patch holes in the hull. Rare materials are normally mined from asteroids or moons but could be salvaged from wrecks or other sources. They include chemicals derived from these sources.

Rare Biologicals are unusual substances derived from biological sources such as plants, fungi or animals. A sample of rare biologicals might be a living organism or preserved material from one. Rare biologicals might be used to synthesise a cure for disease or correct a dietary deficiency among the crew.

Exotic Materials can come from many sources, including very unusual animals or compounds that might otherwise fall into the category of minerals or biologicals.

100 units of specialist materials can be transported per ton of cargo space. It may be that the actual space taken up by the materials is smaller but the protection required to keep materials viable or prevent contamination can be bulky.

Using Rare and Exotic Substances

Rare materials, rare biologicals and exotic materials may be used to solve a range of problems or create capabilities the Travellers need. Several example uses are given in the Using Specialist Materials table but there are other applications. Indeed, these materials can be used by the Referee as a form of currency, allowing the Travellers to create clever solutions to problems at the cost of having to look for necessary materials.

It may be necessary to use up a large quantity of these materials to perform a particular task. For example, superdense hull armour can be made mostly out of ordinary metals (represented by Supply Units) but will need rare or exotic materials mixed in. Quite large quantities may be needed to fix a hole blasted in the ship's armour. Likewise, the amount of rare biologicals needed to synthesise a vaccine for the crew might be considerable, despite the fact that the actual vaccine represents a small final volume.

Specialist materials can be used by the Referee to generate Adventures if the Travellers need them to complete a task and likewise the Travellers themselves may create Adventures by looking for materials to cover future needs. Not even exotic materials can change the universe, however. For example, it is not possible to build jump drive components out of some strange material the Travellers find in order to increase its range. Use of specialist materials must be kept within the bounds of common sense and plausibility but beyond that the Referee is free to use these materials as they see fit.

Extending Supply Duration

The amount of supplies *Deepnight Revelation* consumes in a Reach can be altered by its crew. Skilled personnel and efficient officers make better use of supplies and waste less without having to go short. At the beginning of a Reach the officer in charge of supplies and logistics may make an Average (8+) Admin check. The ship's routine use of spares and supplies is reduced by 2.5% for every point of Effect. A failed check increases supply use by the same amount. This represents habitual efficiency rather than a reduction in the amount of supplies made available.

Using Specialist Materials

Use	Requirement
Make an emergency repair to a shipboard system that will allow it to function for 4D hours even if completely inoperable.	1D Rare Materials
Fabricate a special tool to solve an otherwise very difficult problem, such as cutting through the hull of an alien ship made of resilient compounds.	1D Rare Materials
Create a quantity of special ammunition to tackle a particular type of enemy.	2D Rare Materials or 1D Exotic Materials
Creating an antidote to an exotic venom or a vaccine for an alien disease, sufficient to inoculate 25 people.	1D Rare Biologicals
Create a food additive that will allow the crew to survive on half rations (halving SU use) for a week without imposing MOR penalties.	2D Rare Biologicals
Obtain DM+1 on any CEI or DEI check, providing the Travellers put forward a suitable plan to make use of specialist materials.	2D Rare Materials or 2D Rare Biologicals or 1D Exotic Materials.
Obtain DM+2 on any CEI or DEI check, providing the Travellers put forward a suitable plan to make use of exotic materials.	3D Exotic Materials

It is also possible to deliberately cut the supply budget in order to extend duration. This will inevitably lead to unhappiness and lowered performance among the crew, as well as possible maintenance issues in the longer term. If there is a genuine and obvious emergency the crew will accept the reduced supply budget without their officers having to 'sell' the measures but if the supply budget is cut simply to extend time to the next reprovisioning the crew may be less receptive.

To operate without penalty on a reduced supply budget the officer in charge of supplies must make Difficult (10+) Leadership check with DM-1 per 5% the budget is reduced by. Any negative Effect on this check is applied to an immediate minor MOR check – this check is not made if Effect 0 or better is achieved, since the crew has accepted the situation and agrees it is necessary.

If both methods are used simultaneously, the deliberate reduction of supply budget is resolved first. Efficiency is about making do with what is available, so it is necessary to decide on the budget before determining how well the crew cope with it.

A reduced supply budget may have additional effects.

Lack of Supplies

Deepnight Revelation needs a sufficient supply budget in order to operate properly. It is the amount of available supplies, not the amount actually used, that determines if lack of supplies will become a problem. Thus a reduction due to efficiency does not harm the maintenance schedule but a deliberate reduction in the budget or unavailability of sufficient supplies will have morale effects at least. The maximum the supply budget can be cut by under normal circumstances is 50%. However, it is possible the ship may have to operate with an even lower level of supplies. In an emergency the crew might decide to go on starvation rations in the hope of locating a source of resupply before their strength gives out.

The Supply Level Effects table indicates the effects of a drastically reduced supply budget, in addition to the morale effect of announcing a reduced supply budget. Note that these figures are based on available budget rather than the actual amount used if the supply officer is able to improve efficiency.

Crew Effect indicates the possible reduction in crew efficiency and morale. The indicated Leadership check must be made at the requisite intervals during the Reach. Success indicates no reduction in CEIM or MOR. Any negative Effect must be divided between CEIM and MOR, as the Travellers choose.

Maintenance indicates the DM applied to the maintenance situation at the beginning of the next Reach (see page 53). Note that zero supplies does not mean the ship is completely out of everything; there will still be stashes hidden away or forgotten about and lockers full of components that are not needed. Zero supplies means that no maintenance or repairs can be carried out and the crew are starving.

Supply Level Effects

Supply Level	Crew Effect	Maintenance
0	Automatic reduction of CEIM and MOR by –1D each every 2D days.	+12
1–10% (less than 100 SU per day)	Automatic reduction of CEIM and MOR by –D3 each every 2D days.	+10
11–20% (101–200 SU per day)	Automatic reduction of CEIM and MOR by –1 each every 2D days.	+8
21–40% (201–400 SU per day)	Formidable (14+) Leadership check required every 4D days. Negative Effect must be divided between CEIM and MOR.	+6
41–60% (401–600 SU per day)	Very Difficult (12+) Leadership check required every 4D days. Negative Effect must be divided between CEIM and MOR.	+4
61–80% (601–800 SU per day)	Difficult (10+) Leadership check required every 4D days. Negative Effect must be divided between CEIM and MOR.	+2
81–90% (801–900 SU per day)	Average (8+) Leadership check required every 4D days. Negative Effect must be divided between CEIM and MOR.	+1
91–100% (910–1000 SU per day)	Routine (6+) Leadership check required every 4D days. Negative Effect must be divided between CEIM and MOR.	+0

For example, Deepnight Revelation *normally consumes 1,000 SU per day. Supplies are beginning to run short so at the beginning of a new Reach the Travellers implement a stark regime banning all but the most essential maintenance and placing the crew on short rations. They reduce supply use by 50%. If there was an obvious emergency the crew might accept this without complaint but it is a preventative measure implemented when there are still reasonable levels of supplies available, so the Travellers must convince the crew of the necessity.*

The Travellers are required to make a Difficult (10+) Leadership check at DM-10 due to their 50% reduction in supply budget. Despite an impassioned plea to accept the need to overcome privation during the great voyage the outcome of the check is Effect –5. Since this is negative a MOR check with DM-5 is required. Not surprisingly, it is failed and MOR drops by –1. The Travellers decide this is acceptable; morale will fall steadily if the crew are hungry and systems keep breaking down but the measure buys more time to find a source of supplies.

Deepnight Revelation's crew are efficient and waste little, and her logistics officer is adept at managing the supply situation. The logistics officer makes her Admin check and rolls a total of 11, for Effect +3. The ship's logistics burden is reduced by 7.5%. This is applied to the reduced supply budget already implemented. A 50% reduction in the available supplies gives a budget of 500 SU per day during the current Reach. 7.5% of this is 37.5 SU per day. *Deepnight Revelation* will use an average of 462.5 SU per day or 3237.5 per week. Her crew are hungry and unhappy, and there may be long term maintenance issues but existing supplies can be eked out longer this way.

The reduced supply budget of 500 SU per day (not the actual amount used, which is 462.5) imposes long term problems for the Travellers and their crew. Every 4D days (14 days on average) the Travellers will need to make a Very Difficult (12+) Leadership check. If they pass, the situation does not get any worse. Failure reduces MOR and ECEI by the Effect of the check, divided between the two at the discretion of the Travellers. In this case, the Travellers get an appalling result of 5 on the check and must divide –7 points of Effect between MOR and ECEI. They decide they would rather suffer a mutiny than collapse of the crew' ability to act, so deduce 5 points from MOR and 2 from ECEI.

The crew are starving and angry at the Travellers but able to stagger on in search of a world where they can find something – anything! – to eat. Of course, their desperation might force them to risk landing on a hellworld with a weakened crew but that is the sort of risk interstellar explorers accept. The reduced supply situation will also impose DM+4 on checks to determine the maintenance situation at the beginning of the next Reach.

OBTAINING RESOURCES

It is not possible to predict all the ways the Travellers might come up with to meet their supply needs. The most obvious methods are to mine for metals and minerals, and gather biological materials on planets that have them but inventive Travellers will no doubt be able to come up with others. For example, it is possible to create food – of a sort – out of raw chemicals. If there is no other source of food, planetoids can be mined for materials containing carbon, oxygen and nitrogen, and this can be combined with what organic matter is available to create rations for the crew. The process is lengthy and labour intensive; harvesting plants or hunting meat is a much better alternative.

Since supplies are abstracted as Supply Units, the Referee must determine the nature of any shortage. If the crew has recently undertaken large scale repair work then 'hard' materials are likely to be necessary, such as metals and minerals. A long period of relatively uneventful travel is more likely to produce a shortage of 'soft' supplies such as foodstuffs and raw materials to make clothing. Routine resupply operations should attempt to obtain a mix of types, with an emphasis upon biological materials to make food.

Deepnight Revelation carries equipment that can process most plant matter into something edible, although it may not be appetising, and make cloth out of any fibrous material. Metals can likewise be processed into ingots and used to manufacture spares or components. When gathered, materials are in their raw state and must be processed to make them useful. How much of a given supply source is required to make one Supply Unit depends on the concentration of the source.

There are three levels of concentration for resources: Bulk, Raw and Concentrated. Storage space aboard *Deepnight Revelation* is limited, so wherever possible concentrated resources are preferred. These can be further processed aboard the ship to optimise usefulness and maximise storage capacity. More dispersed resources require additional work or a great deal of space to transport them.

Concentrated resources include pure veins of metals, ready sources of chemicals, such as a salt flats, or high value food such as large creatures that can be hunted without great difficulty. Concentrated resources gain DM+4 on the Resource Value table.

Raw resources are dispersed but do not represent a major problem to gather. Average deposits of metals, minerals that have to be processed out of rock or plant matter that has to be harvested over a wide area all represent Raw resources and receive no DM on the Resource Value table.

Bulk resources are those that have to be gathered in large quantities and processed extensively to create a relatively small quantity of useable materials. Examples include harvesting grass and wood to extract a small amount of edible material or trying to obtain metals from an area with very low concentrations. Bulk materials receive DM-4 on the Resource Value table.

Food and materials are both abstracted as Supply Units, so the Referee must decide whether *Deepnight Revelation* is more in need of one or the other. Materials may be present in large quantities on a planet but the expedition is not equipped for extraction on a large scale so planetoids are a more promising source.

Exotic materials will not be found on a routine resupply mission but it is possible that rare materials or biologicals might be. This is at the discretion of the Referee and should always lead to an Adventure. The Travellers should not be rewarded for routine checks

Resource Availability

Source	Food Concentration	Material Concentration	Rare Materials	Rare Biologicals	Exotic Materials
World with minimal life	Bulk	Bulk	No	No	No
Borderline habitable world	Raw	Bulk	No	No	No
Garden World	Concentrated	Bulk	No	Possible	No
Exotic or corrosive atmosphere world	No	Bulk	Possible	No	No
Typical rockball world or moon	No	Bulk	No	No	No
Typical planetoid field	No	Raw	No	No	No
Rich planetoid field	No	Concentrated	Possible	No	No

with a windfall of special resources – if they want something out of the ordinary they will have to look for it and come up with a plan to get it.

GATHERING RESOURCES

The resource gathering process assumes proper equipment is available. For some resources it is possible to make do with simple equipment – vehicles and weapons for hunting, hand tools for harvesting – but for efficient operations the Travellers will need to make use of technology such as drones and automated harvesting equipment. Metals and minerals can be extracted using the ship's mining drones, which can also be deployed planetside after brief modification. Without these aids the resource gathering process will go very slowly indeed.

Personnel should be assigned to resource gathering as a Mission or a Segment. This can be abstracted unless the details are important – it is generally sufficient to assign a number of crewmembers and resolve their efforts without specifying what every person is doing. The assumption is that activities will be varied, perhaps with some crewmembers using a modified mining drone to extract copper and iron whilst others gather plant material and hunt meat. If the Travellers want to get inventive they can specify how they are going about obtaining resources but otherwise the task can be assumed to be ongoing whilst other crewmembers carry out maintenance or exploration. This means crewmembers may be scattered all over the place when an incident occurs.

Each day of resource gathering produces an amount of SU based upon the concentration of resources and number of crew assigned. Roll 2D on the Resource Value table, subject to modifiers, to determine how many SU are produced per crewmember. The Average SU column assumes 50 personnel are assigned to resource gathering, in several teams, each with a specific goal.

Resource Value

2D+ Modifier	SU Per Crewmember	Average SU Per Day
0–	2D	350
1–3	2Dx5	1,750
4–6	2Dx10	3,500
7–9	2Dx25	8,750
10–12	2Dx50	17,500
13–15	2Dx100	35,000
16+	4Dx100	70,000

Modifiers:

Concentrated Resources	+4
Bulk Resources	–4
CEI	Variable
Inadequate Equipment Available	–2
Very Few Tools Available	–4

For example, the Travellers are desperate for supplies and have to scrounge what they can from a desolate planet with little life. They were short of equipment to start with and have stretched themselves even thinner by assigning 200 of the crew to resource gathering. Using improvised tools or sharing proper equipment between far too many people, the workers begin ravaging the planet for everything edible or otherwise useable they can find.

On the first day the Travellers roll 2D and get a result of 5. To this is added their DEI DM of +1 but the world has only Bulk resources (DM-4) and the shortage of proper equipment imposes an additional DM-2. The end result is +0. Each working party produces an average of 350 SU that day, for a total of 1,400. However, Deepnight Revelation uses 1,000 SU per day so the supply situation is not significantly improved. The second day produces a result of 9, modified by a net DM-5 to 4. Each working party harvests an average of 3,500 resources for a total of 14,000. This is better but with the ship's capacity of 200,000 SU nearly exhausted it will take a good while longer to refill the storage lockers. This task is absorbing the attention of a large portion of the crew, perhaps leaving the ship vulnerable if an incident occurs...

SPECIAL RESOURCES

Exotic materials, rare materials and rare biologicals can be found on some worlds. They are highly useful and finding a source should be the trigger for an Adventure if the Travellers seek to obtain them. For example, exotic materials might be found in the debris of a drifting alien wreck. This is a noteworthy event requiring a Mission to investigate, analyse and extract the materials as well as learning about the wreck itself. Similarly, rare biologicals might be found on a world with an unusual biosphere, which could prove hazardous or at least time consuming.

In short, the Referee should not allow the Travellers to gain access to special materials without going to some effort. Obtaining these useful substances is not the subject of an abstracted check; it requires planning and execution of a Mission, perhaps with the personal intervention of the Travellers.

At times, the Travellers may encounter rich sources of mundane supplies. Whilst perhaps not of great significance to science, they are an opportunity to obtain supplies efficiently, with minimal disruption to the progress of the mission. Such finds can occur in the course of normal exploration or at the Referee's discretion, although the Travellers might increase their chances of finding a rich resource through good planning. For example, if they predict an Earth-like planet in a star system and check it out as a possible supply source, the Referee may decide to reward their initiative with success. The same goes for locating planetoid belts with a high likelihood of useful materials.

If the Referee (or blind luck) decides the Travellers have found a rich source of supplies, the amount of SU gathered per day may be increased by 100% or more. There is always the chance of unexpected complications or dangers; an apparently rich supply world could turn out to be a hell of carnivorous plants and hidden dangers. Risk and reward go hand in hand in space exploration.

SUPPLY AND ABSTRACTED TRANSITS

The Travellers are capable of reducing the supply burden and this can be done even when abstracting a transit. However, the Travellers must do it. If they do not want to trouble themselves with an extra check or two to determine supply efficiency, they cannot expect the Referee to do it for them. So, if the Travellers do not implement a policy of streamlining supply use – and oversee it themselves – the Referee can assume a standard 1,000 SU per day consumption rate.

This translates to 28,000 SU used in a standard four week cycle. CFI also increases by +1 over an average of 21 days. If the Travellers were to make six one-month Reaches in rapid succession, potentially putting them as much as 60 parsecs closer to their destination, they could expect to use up 168,000 SU. *Deepnight Revelation* would then be at less than one-quarter capacity and in need of resupply. CFI would have increased by an average of +8 points and it is likely the crew would be at least somewhat Fatigued. This represents the upper limit of what could be safely achieved and creates an urgent need for resupply and defatiguing activity. However, it is likely that a point of interest or unexpected event would divert the Travellers before the completion of such an ambitious advance.

CHAPTER SIX

REPAIRS & MAINTENANCE

At the beginning of each Reach, the Travellers must determine the maintenance situation of their ship. This will identify any problems and give an indication of their severity. Any problem can be ignored, of course, but eventually *Deepnight Revelation's* systems will start to break down.

To determine the maintenance situation at the beginning of a Reach, the Travellers must make a Maintenance check, which is an Average (8+) CEI check. The DEI of a dedicated maintenance detachment can be used instead if one has been created and has been able to operate without interruption throughout the Reach. The Effect of this check is noted and can be used to annul problems as they occur.

To determine how many problems emerge and their nature, the Referee should make a 2D roll, subject to DMs at the Referee's discretion.

Supply Level	+Maintenance DM as shown on page 49
Damage to Hull	+1 per full 10% of Hull points lost
Per full year into the voyage	+1
Substandard maintenance undertaken	+2
Very little maintenance undertaken	+4
No overhaul in the last 24 months	+2

The Maintenance Issues table indicates the nature of problems caused by a poor maintenance situation in terms of Defects, Breakdowns and Failures.

A Defect is a minor but persistent problem, imposing DM-1 on any task using that system until repaired. When a Defect is indicated the Referee should assign it to a system and subsystem using the process on page 54. Multiple Defects to the same subsystem are possible, giving a maximum DM-6. At that point the Defect becomes a Breakdown.

A Breakdown indicates the system is either reduced in capability due to the failure of a component part, or has ceased to function completely. For example, a Breakdown in the manoeuvre drive reduces the ship's Thrust by –1, whereas a Breakdown in the spinal weapon indicates it is inoperable until repaired. A Breakdown can be jury-rigged on a temporary basis.

A Failure indicates the system has failed completely and cannot be used until repaired. It cannot be jury-rigged and will be more difficult to repair than a Failed system.

Maintenance Issues

2D+ Modifiers	Defects	Breakdowns	Failures
1–3	0	0	0
4–6	1	0	0
7–9	2	0	0
10–12	3	0	0
13–15	1	1	0
16–18	2	1	0
19–21	3	1	0
22–24	1	2	1
25–27	2	2	1
28–30	3	2	1
31–33	1	3	2
34–36	2	3	2
37–39	ALL	3	2
40–42	ALL	ALL	2
43+	X	X	ALL

ALL indicates that every system and subsystem aboard the vessel is affected. In the case of all systems suffering a Failure, *Deepnight Revelation* becomes little more than a hulk, slowly dying in deep space. Barring a miracle, the Travellers are doomed.

Offsetting Problems

The Effect of the Maintenance check can be used to annul problems. A Defect can be annulled for 1 point of Effect; a Breakdown for 3, and a Failure for 6. This is done before the nature of the problem is determined.

Assigning Defects, Breakdowns and Failures

When a problem is indicated, it is allocated to a specific system and subsystem starting with the System table. Failures are assigned first, then Breakdowns, then Defects. Multiple Defects can occur to a system but only the most severe of the three types of problem can affect a particular subsystem. A Defect is irrelevant if the drive has already Failed, for example.

Defects: The effects of Defects are detailed on the Subsystem tables.
Breakdowns: If the system has a numeric value (such as jump capability or manoeuvre drive Thrust) it is reduced by –1. If the system either works or does not, such as the spinal weapon, it ceases to function but can be jury-rigged.
Failures: The system ceases to function and requires major repairs.

The Referee must decide upon the nature of a Breakdown or Failure. For example, if *Deepnight Revelation* suffers a Failure of 'Bridge, All' this could mean catastrophic damage to the bridge if it results from a collision or internal explosion, but is far more likely that the bridge has been taken offline due to severance of power and communications cabling. The bridge is still intact but useless until the problem is fixed.

Subsystem

1D	Subsystem
1–2	Structure table
3	Sensors and Electronics table
4	Drives and Power Systems table
5	Weapons and Defensive Systems table
6	General table

Structure

1D	Subsystem	Defect Effect
1–3	Hull, Minor	3D Hull points lost per Defect
4	Hull, Major	3Dx10 Hull points lost per Defect
5	Armour	1 point of Armour lost per Defect
6	Cargo	10% of cargo space and supplies stowage becomes unusable per Defect

In the case that the hull is affected by a Breakdown lost Hull points are multiplied by 10. A Failure multiplies Hull point loss by 100. One point of Armour is lost on a Defect result, D3 points on a Breakdown, and 1D on a Failure. A Breakdown of cargo space makes half of the ship's capacity unusable and may destroy or disperse cargo stowed there. A Failure makes 90% of cargo space unusable.

Sensors and Electronics

1D	Subsystem	Defect Effect
1	Navigational Systems	DM-1 per Defect on all tasks using navigational sensors, such as piloting or plotting a jump
2	Combat Sensors	DM-1 per Defect on all combat-related sensor tasks such as detecting and tracking other vessels
3	Mission-Related Sensors	DM-1 per Defect on all tasks using mission-related sensors such as analysing an alien relic or surveying a planet
4	Computer	Bandwidth reduced by –1D per Defect
5	Bridge, Command	DM-1 per Defect on all tasks requiring command from the bridge, other than flight operations.
6	Bridge, All	DM-1 per Defect on all tasks requiring command from the bridge

A Breakdown of the ship's computer reduces Bandwidth by half its current value. A Failure takes the computer offline, leaving only emergency backup systems for local control, with no ship wide systems integration. Tasks requiring command from the bridge include any that must be coordinated. For example, plotting and executing a jump requires cooperation between the astrogator and chief engineer, and thus needs bridge coordination. Weapons firing under local control do not.

Drives and Power Systems

1D	Subsystem	Defect Effect
1	Jump Drive, Minor	DM-1 per Defect on all tasks involving the jump drive
2	Jump Drive, Major	Jump score reduced by –1 per Defect
3	Powerplant, Minor	DM-1 per Defect on all tasks involving the power plant, including reallocation of power between systems
4	Powerplant Major	Power plant output reduced by 15% per Defect
5	Manoeuvre Drive, Minor	DM-1 per Defect on all tasks requiring Thrust
6	Manoeuvre Drive, Major	Thrust reduced by –1 per Defect

Weapons and Defensive Systems

1D	Subsystem	Defect Effect
1	Spinal Weapon	DM-1 per Defect on all tasks involving the spinal weapon
2–3	Secondary Weapon System	DM-1 per Defect on all tasks involving one weapon type such as lasers or missiles
4	Defensive System	DM-1 per Defect on all tasks involving one defensive weapon or electronic system
5	Combat Sensors	DM-1 per Defect on all combat-related sensor tasks such as detecting and tracking other vessels
6	Craft Bays and Drones	DM-1 per Defect on all tasks involving the launch, recovery or control of small craft, drones or probes

Where there is more than one possible subsystem, such as in the case where a Defect falls on secondary weapons and there are lasers, missiles and particle accelerators to choose from, one should be chosen at random by the Referee. The Defect affects all weapons of that type.

General

1D	Subsystem	Defect Effect
1	Life Support	DM-1 per Defect on all tasks
2	Internal Gravity	DM-1 per Defect on all tasks
3	Small Craft	DM-1 on all tasks involving craft handling
4	Fuel Processors	Fuel skimming and processing takes 10% longer per Defect
5	Mission System (laboratory, observatory or similar)	DM-1 on all tasks using that asset until rectified
6	General Systems	Special

General systems refers to the ship's lighting, heating, cooking, recreational and similar functions. Each time a problem is indicated the Referee should assign it to a different area, such as a lighting fault in the main galley or water leak in an accommodation block. Breakdowns and Failures in General systems are not as severe as other areas – the total failure of the main galley is certainly inconvenient but unlikely to be life threatening. If there are any Failures in General systems the crew suffers MOR-3. If there are Breakdowns the penalty is –2 and if there are Defects the penalty is –1. Only the largest penalty applies but it is applied until all problems of that severity are resolved.

For example, Deepnight Revelation suffers total failure of the general systems in one of her accommodation blocks. The area becomes unliveable, with intermittent lighting and ventilation faults, personnel get electric shocks when touching some walls and a host of other annoyances that reduce morale. There are also sundry minor faults elsewhere, at the Defect level, but only the MOR-3 penalty for the main issue applies. Once fixed, the crew start to notice all the other stuff; MOR is reduced by –1 until these problems are all put right.

EROSION OF CAPABILITIES

Despite the best care, *Deepnight Revelation* will suffer a slow erosion of her capabilities due to natural wear and tear. Micrometeorite impacts, structural stresses, high winds during a gas giant refuelling pass… almost everything the ship does will cause her a little harm and over time these minor factors will begin to add up. The result is a slow erosion of capabilities, which will be exacerbated by the Travellers' actions. For example, if they decide to bull their way through a ring system at speed, *Deepnight Revelation* will be peppered with many small impacts. None of these is likely to have much effect on its own but antennae and electronics close to the surface of the hull may be damaged and there is always the possibility of a larger impact somewhere vulnerable. The same applies to high-stress manoeuvring or other hard uses of the ship. Over time, damage accrues and components may be weakened.

This erosion of capabilities may manifest itself at any time, although the first six months after a dockyard overhaul or attention from the fleet tender at Point Demnan will not see significant effects. The Referee may, at their discretion, impose a check to determine if the many small problems have amounted to anything significant. It is recommended that this is done after any situation where the Travellers take a brute force approach to a problem but a check after a long transit is also reasonable.

The check is normally an Average (8+) CEI check. If the crew passes, it can be assumed that their routine maintenance and running repairs have kept problems from developing. The ship will never be in perfect condition once she leaves Charted Space; there will always be glitches, damaged sections of control conduit, antennae clusters that do not traverse properly and so forth. However, a diligent crew can keep these minor issues within tolerable limits.

If the check is failed, the Referee may impose a number of Defects equal to the negative Effect. Roll 1D – on a 4+ any Defect imposed in this manner is temporary; after a few hours the problem is bypassed or resolves itself. Others are permanent until repaired.

For example, the Travellers are rather wreckless when approaching a world and have to make a violent aerobraking manoeuvre. They have been doing this sort of thing a lot lately and the ship is beginning to show signs of strain. An Average (8+) CEI check after the incident produces Effect –2. The first Defect is determined to be a major jump drive fault. The Referee rolls 1D and gets a 2; it is temporary but the Travellers do not yet know that. The second is a minor Hull Defect, in this case the loss of 12 Hull points. The Referee decides not to determine if that is temporary since it is unlikely hull damage will somehow go away.

The Travellers protest that merely plunging into an atmosphere could not reduce their jump capability but the Referee explains that they have been using the ship pretty hard lately and there are minor faults appearing everywhere. One of them has affected the main power and fuel conduits to the jump drive, making use of *Deepnight Revelation's* full jump capability very risky. The problem was probably due to hull flexing, since it seems to be temporary, but the Travellers might want to be aware they are slowly breaking their ship.

The Travellers order an inspection and repair of the damaged conduits as well as an audit of other minor damage and resolve to be a little more careful in future…

MAINTENANCE AND REPAIR

Routine maintenance and monitoring of systems goes on all the time, typically when the ship is in jump space. If the regular cycle of preventative maintenance is interrupted for a significant period the 'substandard maintenance' penalty (see page 53) applies when determining the maintenance situation at the beginning of the next Reach. What constitutes a significant period is up to the Referee but as a rule a day or two with little maintenance work, enabling the crew to rest or deal with a serious situation, will not be a problem. On the other hand if a mutinous crew ignores the maintenance cycle for over 10 days, or everyone is impaired by a bad case of shouldn't-have-eaten-that for a fortnight, maintenance will suffer unless strenuous efforts are made to remedy the situation.

Likewise, a crew that almost totally ignores routine maintenance for more than 20 days will suffer the 'little or no maintenance' penalty (page 53). This is unlikely to

happen unless shipboard discipline has entirely broken down but could be the result of casualties or a need to pull personnel away for other, critical tasks.

The necessary level of maintenance assumes a full crew carrying out routine tasks as part of their normal watch rotation. Slight shortfalls can be made up here and there as necessary without imposing a penalty but if the number of personnel available to conduct routine maintenance falls below 60% of the ship's starting complement for more than 10 days, a maintenance shortfall exists. This can be remedied by a Mission conducted specifically to catch up the most urgent tasks and if this is not done by the end of the Reach the 'substandard maintenance' penalty applies. If personnel available drops below 30% of starting complement for more than 20 days a severe maintenance shortfall exists. Again, this can be remedied by a major effort and until one is made a 'little or no maintenance' penalty applies.

Note that the penalty will be applied at the beginning of the next Reach and imposed on determination of the maintenance situation before any attempt can be made to remedy it. If the Travellers do not successfully remedy the situation the penalty continues to apply in every future Reach until remedial measures are taken.

It is quite possible to offset a maintenance personnel shortfall by re-tasking people from other parts of the crew. Of course, scientists replacing coolant pipes are not available to do their own jobs and may become disaffected. The maintenance issue can be downplayed by the Referee if desirable to prevent the voyage from turning into a bean-counting exercise but it is one of the driving factors in many adventures so the Referee should not be too lenient. A critical maintenance issue that forces the Travellers to land on a dangerous planet or continue with a Mission even when it has become very difficult, helps the Referee involve the Travellers and their crew in the adventures that await them.

OVERHAULS

Normally a starship will enter a dockyard for major maintenance, usually scheduled annually, and for full refits at various times in its career. This option is not available during the voyage of *Deepnight Revelation*. Unless the ship is very hard-used a full refit will not be necessary during the expected period of the voyage. However, an overhaul every 12–18 months is essential to keeping the vessel functioning within acceptable limits.

A full overhaul will take 2D+12 days and absorbs the attention of almost the entire crew. Most of the work

done is preventative maintenance that does not repair broken down systems or damage to the hull. However, repair tasks can be built into the overhaul period and resolved using the system on page 89. An overhaul would normally be carried out in orbit over a suitable world but does not require specialist facilities. If the overhaul is interrupted some systems may be offline or in pieces on the cargo bay floor, so choosing a suitable time and place is of paramount importance.

An overhaul will be automatically completed to an acceptable standard providing the Travellers are diligent and the crew willing to do the work. If morale is very poor, some jobs may be skimped or left undone but the lives of everyone aboard depend on the ship being kept in good working order, so things would have to be very bad before serious problems were ignored or critical systems left unchecked.

An overhaul requires 4Dx5,000 Supply Units. This can be reduced by a successful Difficult (10+) Admin check, with SU consumption reduced by 5% per point of Effect. A negative Effect increases consumption by 5% per point.

Making Repairs

Minor repairs to most systems (the jump drive, hull and armour are obvious exceptions) can be made whilst the ship is underway or in jump. Larger repairs require a halt to allow critical systems to be taken offline. How long a repair takes depends on the nature of the problem and the resources required, as well as the number of crewmembers available.

To conduct a repair, the Travellers must first form a Team to tackle it, containing sufficient personnel to match the size of the system being repaired. Most personnel assigned to a repair crew must have relevant skills, so will usually come from the Engineering Division but up to 25% of those assigned may be 'extra hands' with no relevant skills.

Minor Systems include most electronics and control systems. A minor system repair requires 20 personnel.
Major Systems are larger or more dispersed, such as the power plant, jump and manoeuvre drives, spinal weapon, or a large battery of secondary weapons. Repairs to a General systems defect are treated as a major system. A major system requires 50 personnel.
Structural Systems are the hull and armour, and any other very large parts of the ship if the Referee considers it appropriate. A structural system repair requires 100 personnel.

The time taken to complete a repair depends on the size of the system and severity of the problem. A successful repair to most systems removes a Defect, Breakdown, Failure or a Critical Hit received in combat, although it uses up a quantity of supplies and possibly rare and exotic materials. If insufficient supplies are available the repair cannot be made.

Major repairs to structural components such as the hull cannot normally be made with a ship's own resources. *Deepnight Revelation* carries additional equipment that allows the crew to perform such an evolution, although this is highly labour-intensive and requires the ship to remain in stable orbit or dead in space throughout.

The time taken for repairs assumes sufficient personnel are assigned. An understrength Team can still attempt the task but time taken is increased by 50% for any significant personnel shortfall and an additional 20% for every 10% shortfall in the necessary personnel. In addition, DM-1 applies to attempts to resolve the repair for every 10% shortfall in personnel

Repair	Hours	SU Cost	Additional Cost
Defect on a minor system	2D	2Dx100	None
Critical hit on a minor system	4D	4Dx100	2D rare materials or 1D exotic materials
Breakdown on a minor system	6D	6Dx100	3D rare materials or 1D exotic materials
Failure on a minor system	8D	8Dx100	4D rare materials or 2D exotic materials
Defect on a major system	5D	2Dx500	None
Critical hit on a major system	10D	4Dx500	4D rare materials or 2D exotic materials
Breakdown on a major system	20D	6Dx500	6D rare materials or 3D exotic materials
Failure on a major system	30D	8Dx500	8D rare materials or 4D exotic materials
2D+6 Hull points	2Dx10	2Dx5,000	4Dx10 rare materials or 1Dx10 exotic materials
1 point of Armour	2Dx50	2Dx2,000	2Dx100 rare materials or 1Dx100 exotic materials

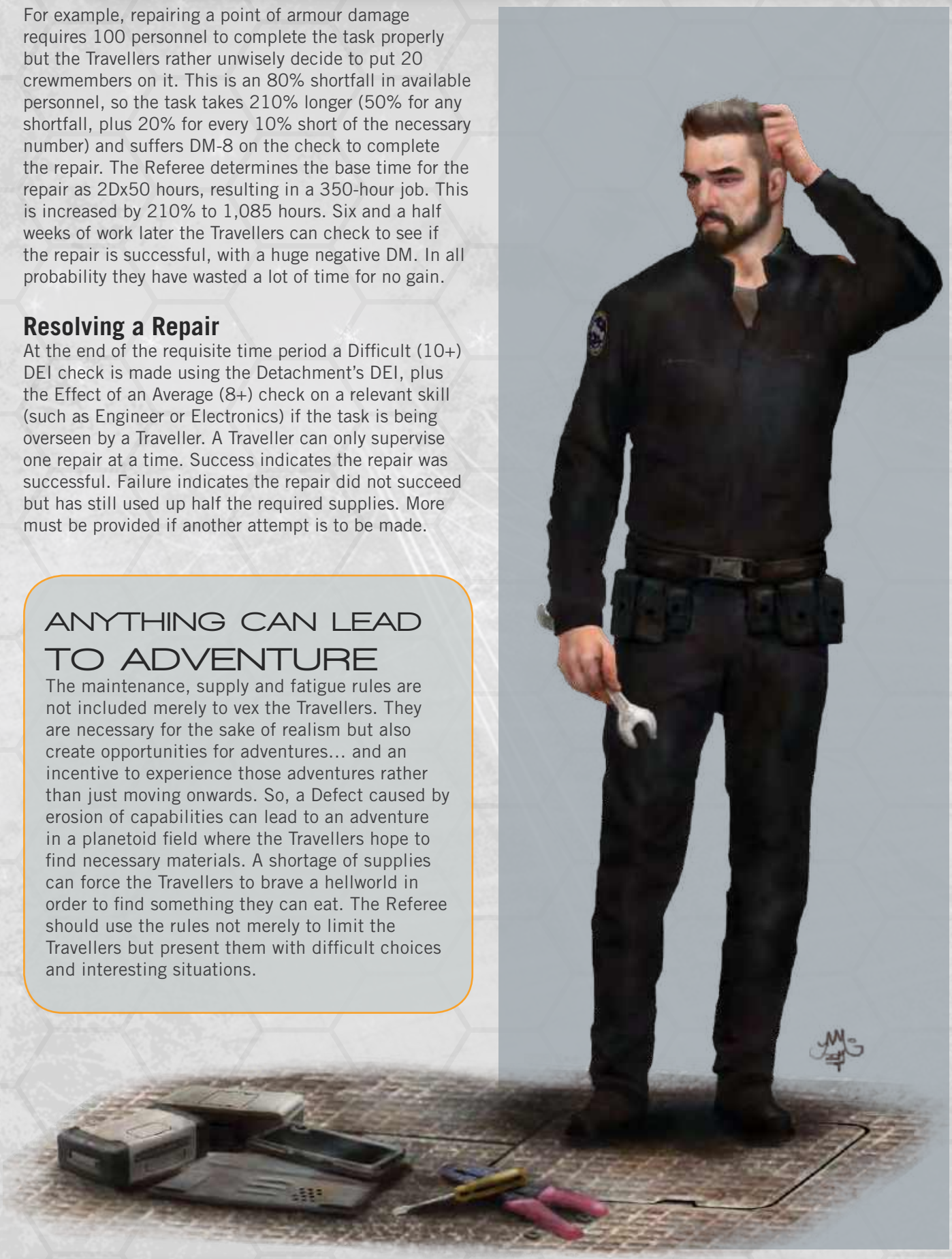
For example, repairing a point of armour damage requires 100 personnel to complete the task properly but the Travellers rather unwisely decide to put 20 crewmembers on it. This is an 80% shortfall in available personnel, so the task takes 210% longer (50% for any shortfall, plus 20% for every 10% short of the necessary number) and suffers DM-8 on the check to complete the repair. The Referee determines the base time for the repair as 2Dx50 hours, resulting in a 350-hour job. This is increased by 210% to 1,085 hours. Six and a half weeks of work later the Travellers can check to see if the repair is successful, with a huge negative DM. In all probability they have wasted a lot of time for no gain.

Resolving a Repair

At the end of the requisite time period a Difficult (10+) DEI check is made using the Detachment's DEI, plus the Effect of an Average (8+) check on a relevant skill (such as Engineer or Electronics) if the task is being overseen by a Traveller. A Traveller can only supervise one repair at a time. Success indicates the repair was successful. Failure indicates the repair did not succeed but has still used up half the required supplies. More must be provided if another attempt is to be made.

ANYTHING CAN LEAD TO ADVENTURE

The maintenance, supply and fatigue rules are not included merely to vex the Travellers. They are necessary for the sake of realism but also create opportunities for adventures... and an incentive to experience those adventures rather than just moving onwards. So, a Defect caused by erosion of capabilities can lead to an adventure in a planetoid field where the Travellers hope to find necessary materials. A shortage of supplies can force the Travellers to brave a hellworld in order to find something they can eat. The Referee should use the rules not merely to limit the Travellers but present them with difficult choices and interesting situations.



CHAPTER SEVEN

GENERAL OPERATIONS

In the course of their voyage the Travellers will undertake certain actions on many occasions. These are grouped here under the heading of 'general operations' and concerned mainly with flying and operating the ship, obtaining supplies and staying up to date with maintenance.

DUTY STATIONS, WATCHES AND SHIFTS

Keeping a big ship like *Deepnight Revelation* operating efficiently requires effective division of labour and solid standard procedures. Each crewmember needs to be confident that others will do their job not only well but at the right time and in the correct manner. A well-integrated crew passes information to those who need it both in an emergency and under routine circumstances, reducing the chance of oversights and omissions, and can be directed with minimum explanation.

It is thus important to have teams used to working together and integrating with other teams elsewhere in the ship. Standardised procedures for watch-standing and crew rotation need to be established if *Deepnight Revelation* is to proceed with her mission. Those given here are a default. The Travellers might have a different preference but failure to have a well-established set of procedures will lead to disaster.

Standard procedures have an additional benefit. The Referee is able to determine who is where and doing what at any given time without asking the Travellers for specifics that might alert them to what is happening.

By default, *Deepnight Revelation* uses a three-watch system, each of eight hours with a 'preparation for watch' period of one hour immediately beforehand. Crewmembers due to come on watch can be expected to be getting ready during this hour, although some will inevitably leave it very late. Aboard a properly run ship the watch changeover is relaxed but efficient, with replacements ready to swap positions on the minute and with no disruption to function. This requires everyone to have what they need at hand before the swap and those coming off watch to be ready to vacate without having to run around looking for coffee cups, datapads and odd pieces of equipment they are sure they were just using.

Every crewmember has an assigned duty station and will normally begin each watch there. A pre-watch briefing might be held, although this is not always necessary. Commonly, crewmembers with a specific function will go to their console or workstation, whilst those whose work is more varied may assemble in their duty area to be given tasks. Thus a change of watch on the bridge will take the form of crewmembers formally relieving their predecessor at a duty station and logging into their console, whereas the stewards might gather to hear what the head of their team has decided they will be cooking and what additional tasks are required.

During routine operations and particularly when the ship is in jumpspace, the three-watch system rotates endlessly with a designated officer of the watch dealing with whatever needs their attention. This might be a discipline problem, anomalous sensor readings that might require the captain's attention or almost anything else. The officer of the watch has the difficult decision whether or not to disturb the captain if something serious happens and any officer has the authority and responsibility to sound the emergency alarm if the situation merits it.

In an emergency or when something critical is happening, all crew are 'on duty' and report to their emergency stations. The most skilled are assigned primary duty stations such as the main bridge, with lesser crewmembers waiting at backup positions such as the secondary bridge in case they need to take over a primary function. For a military ship an emergency would likely mean combat or the need to be ready for it but for the crew of *Deepnight Revelation* the emergency alarm could mean anything. After the scramble to reach emergency stations the crew will wait anxiously for information and false alarms will place a lot of strain on everyone's nerves.

The role of officer of the watch will normally rotate through the chief, senior and junior officers. Command of the ship during a watch is exercised by the most senior officer on duty, other than the captain and executive officer. They will normally be busy with long-term planning and tasks associated with running the ship while nothing serious is happening and take over when a sensitive task is to be undertaken.

So, if *Deepnight Revelation* spends a day or two in orbit around a world being surveyed by landing parties it is likely that, for most of that time, routine command decisions will be made by one of the Division chief officers or perhaps a senior officer from Flight or Operations Division, whilst the captain and executive officer are busy with other tasks but available to handle sensitive situations. If an incident occurs, the captain will be called to the bridge to take over but a good set of officers can tread the fine line between disturbing the captain too often, and thus disrupting the running of the ship, and not calling them soon enough as a major incident develops.

When the ship is not in jump there will always be a qualified pilot and sensor operators on the bridge, along with an officer capable of exercising command over the whole vessel. A backup pilot and an officer of some description will be close enough to the secondary bridge to take over in an emergency. The main engineering control room will always be manned by a qualified officer and additional personnel as needed.

INTERNAL SECURITY

Large naval ships have security patrols roving the vessel at all times but this is not really feasible aboard *Deepnight Revelation*. Instead 'walkaround' procedures are in place (see page 63) and most security functions are handled automatically. The system flags irregularities such as someone not authorised to be wandering around one of the secondary power plant chambers. The officer of the watch will then direct personnel to investigate. This will usually be members of the Tactical Department within Operations Division but nearby personnel might be informally asked to take a look at what is going on.

It is standard practice to have a team of security personnel on call during every watch. Whether these personnel are armed or not under routine circumstances is up to the Travellers and it is likely they will have a task to perform whilst not responding to a call. On any given day there may be dozens of minor irregularities flagged by the security system; crewmembers dashing back to a duty station to pick up forgotten items or ask a question, stewards looking for a particular ingredient in obscure lockers and all manner of other innocent actions that trigger flags in the system. Sending armed teams racing to investigate each time will rapidly become wearying for all concerned, so the Travellers will need to balance security against long-term functionality.

Personnel Access

All crew and mission personnel are assigned a status when they come aboard. This indicates to the ship's security system what they should have access to.

Anyone not in the database is considered 'invalid' by the security monitoring system, as are crewmembers relieved of duty for medical or disciplinary reasons. A crewmember entered into the database as missing or dead is also 'invalid' and will trigger alerts if they return to the ship and try to access areas they previously had clearance for. It is a simple matter to reinstate a presumed-dead crewmember but until it is done they remain invalid.

To be valid, a crewmember must have formally reported aboard and been entered on the system. At this time the crewmember's clearance to access different parts of the ship is determined. It can be changed with the captain's authorisation and will automatically update if the crewmember is given a new job or rank. Someone who is promoted gains all the access clearances of their new rank and retains any special accesses they previously had unless cancelled. This can create loopholes in the security system.

Systems and areas of the ship are assigned a clearance level. Anyone without clearance in that area, or someone who normally would have clearance but is currently invalid for any reason, will trigger a security flag at least. Sensitive systems and areas will trigger more serious alerts; thus if an unauthorised crewmember accesses a cargo hold this will normally trigger a minor security flag. The same crewmember opening the nuclear munitions locker will cause a more serious alert and lockdown of the affected system or area.

Unsecured: No security is in place in an Unsecured area. Anyone may operate the system or be in the area without attracting the ship's security monitoring systems. Officially there are no Unsecured areas within *Deepnight Revelation* but the rebuilding process has resulted in a few dead spots. These may become known to crewmembers who want to hide something and in some cases can be used to move around. It is also possible that some areas will be deliberately deserted for the sake of convenience and an Unsecured 'hole' could be made in a ship's monitoring system by a skilled programmer.

Any Valid: Anyone recognised as valid may enter these areas and use these systems and will not attract security protocols. Normally Any Valid is reserved for guest quarters, mess areas and other locations where there is little a visitor can do to cause harm.

Any (Division): Any member of the relevant Division may operate these systems. Some systems require special authorisation whether or not a valid crewmember is trying to use them; for example, the ship's weapons are controlled by the command team. If the weaponry

is set to 'tight' then it cannot be fired no matter who is pounding on the buttons. Likewise, whilst any crewmember can go into the engineering chambers to help out, a non-engineer attempting to alter the settings on the power plant will attract attention.

Any (Rank or Duty): Some systems are accessible only to personnel of a certain rank or who have been assigned a particular duty. Thus only personnel with responsibility for maintaining firearms have access to the armoury and the bridge is normally restricted to officers and personnel whose duty station is there. Categories can be quite broad, such as Any Flight or very narrow such as Any Senior Mission Officer.

(Specific): Some posts aboard ship have specific access to systems other crewmembers do not. The captain and executive officer have blanket access to more or less everything and other posts have specific access to certain systems. Sometimes this is dependent upon duty; for example, a quite junior officer might be serving as officer of the watch or senior bridge officer, and during this period they will have access to systems normally above their clearance. An officer from Operations would not normally be authorised to declare the ship's weapons free,but if they are the senior officer on bridge watch when a hostile vessel approaches they need the ability to do so without waiting for authorisation.

Division heads and their deputies have override access to most areas within their remit and can usually authorise others to handle a task. The ship's computer is set to recognise a valid order and assume authorisation. So, if the executive officer orders someone to break out a piece of restricted equipment, the computer recognises this as authorisation. This function can be disabled, requiring formal authorisation to be granted to specific individuals but this is more time-consuming and would normally be done only if the ship is operating under very secure conditions, such as when infiltration is suspected.

Under normal conditions, this system ensures crewmembers can go about their duties without needing constant authorisation or setting off alarms but anyone who does something they would not normally be expected to do (such as a chef trying to enter a restricted laboratory) will be locked out and security staff notified. Orders given by someone who can authorise such tasks will remove this prohibition. However, there are workarounds that slightly undermine the system. For example, the captain may give their expert scrounger access to all areas or a research assistant might need to get into the missile launching chambers to customise the long-range probes. This is not normally a problem but can lead to a supposedly secure system becoming full of little holes created by special permissions.

In the event the ship suffers catastrophic loss of its command staff, there may be no-one aboard who can authorise the use of critical systems. The security system uses a 'top 10' ranking, which tracks the 10 most senior members of the chain of command at all times. If three of these 10 personnel agree on a nominee as acting commanding officer, then command devolves to that individual and they can assign posts as desired from that point on.

Under more normal circumstances the devolution of command follows a clearly defined path and the ship's computer simply informs the appointed person that they are now in command of the ship. An individual may decline, in which case the computer moves to the next most senior member of the crew. Declining emergency command is a difficult decision but a badly damaged vessel might be better off with her experienced chief engineer at their post rather than trying to run the whole ship, even if this means placing a 20-year-old assistant sensor technician in temporary command.

Shipboard security and command systems depend heavily on the ship's computer but can still function if it is disabled. All crewmembers carry a personal identity card that is automatically updated with

their valid status when they come aboard a ship. Doors, systems and workstations all have readers for crewmembers' keycards and can recognise an authorised person even if the computer is down. Updating status with authorisation and permission is difficult under such circumstances but there are few occasions under which a ship might have to function without her computer system and all its backups.

Some command decisions, notably freeing weapons to fire and initiating jump, require multiple authorisations. For weapons fire, the captain must authorise 'weapons free' and the gunnery officer must authorise a battery to fire – and both must be valid at the time the order is given. Command override applies under such circumstances. For example, the executive officer is assumed to speak for the captain at all times unless specifically countermanded, so can directly order a battery to open fire. This is a breach of protocol if the gunnery officer is in place and functioning but a bypass is permitted if necessary.

Ultimately, all authority aboard a ship devolves from its captain and runs down the chain of command. If the captain chooses to remove someone from the chain of command or rescind authorisation to carry out specific tasks then this is their prerogative. However, under most circumstances a legal order is assumed to carry the full weight of the captain's authority, so if the gunnery officer tells the crewmember in charge of point defence to open fire, this order does not need to be confirmed by the captain. Under normal operating conditions a ship's point defences are considered 'free' on the authority of the gunnery officer or senior gunnery department officer on duty, whilst offensive systems need authorisation from the bridge before they can be brought into action.

POST-JUMP PRIMARY

The post-jump primary procedure for *Deepnight Revelation* is not so different to other ships. It consists of gathering positional data, checking the drives and a security walkaround. The latter is more about checking for shifted cargo and structural problems – and perhaps crew pilfering – than searching for intruders and is generally quite cursory. At the end of a successful post-jump primary, the Travellers will know the following:

- If their navigational data matches the expected emergence system
- Their location in the emergence system, including distance from the mainworld or other target location, heading and velocity
- Basic data on the star system such as number and type of stars, gas giants and planetary bodies
- Presence of any radio or similar emissions that might indicate intelligent life
- Status of the ship and crew, in general terms
- Status of the jump drive and its fuel situation
- Presence of any obvious structural or internal problems

A post-jump primary is a routine procedure for experienced spacers. The Travellers will make an Easy (4+) check using CEI. Success indicates an initial status report moments after exiting jump and a more detailed one 20–30 minutes later – after the walkaround is completed. This is typically performed by crewmembers stationed in various parts of the ship stepping into adjacent compartments to ensure everything is in order but could be done by a dedicated security detachment. However, that would take far longer.

The Referee should establish the habit of always asking for an Easy (4+) check and the Travellers may think a successful check indicates everything is as reported. However, if there are circumstances that are more difficult to detect, such as an alien creature hiding in a remote corner of the ship or a structural defect just beginning to develop, the Referee may decide that a higher Effect is needed to spot the problem. The check indicates a proper walkaround has been completed and will have spotted anything that would normally be spotted, whilst achieving the high Effect allows detection of a concealed intruder or less apparent problem.

SECURITY SWEEP

A full security sweep of the ship is a larger undertaking. Given the nature of the mission, a sweep is mainly concerned with 'internal' problems; personnel are looking for structural and equipment problems as well as signs of pilfering and misuse of resources. However, intruders and stowaways are always a possibility, however remote, and security personnel are expected to search possible hiding places.

A sweep will normally be made by qualified personnel, operating as pairs or squads. Areas with highly technical equipment will be assigned specialists who can tell if something is out of the ordinary but the majority of personnel will be non-specialists with security-related skills rather than technical expertise. *Deepnight Revelation* has a few security experts, with the remainder of the hands-and-eyes of the sweep made up of crewmembers detached from their normal duties. Whether or not the security parties are armed is up to the Travellers. The default would be sidearms and batons for most personnel, with backup teams armed with heavier weapons stationed at critical points. These teams not only stand ready to assist anyone who finds something out of the ordinary but also act as a cordon to prevent individuals sneaking out of an area being searched.

If the Travellers try to impose an alien-monster-proof security protocol, they may end up antagonising the crew and lowering morale. Insisting that everyone dons vacc suits and breaks out plasma guns for every routine sweep just makes more work for all those involved. A more sensible balance of capability and ease will be acceptable.

A full security sweep of the ship takes 2Dx30 minutes assuming a reasonable force is assigned. The sweep is carried out properly if an Easy (4+) check is made using CEI or the DEI of a security detachment formed for the purpose. A successful sweep does not automatically detect anything untoward but is much more likely to do so than a simple walkaround. Whilst a post-jump primary might miss something obvious, the Referee should assume a diligent sweep will find evidence of any problem not extremely well hidden. Of course, 'finding' an intruder might mean disturbing its hiding place and being attacked but that is still a result of sorts.

IN-SYSTEM OPERATIONS

A typical commercial starship does not perform much long-range in-system manoeuvring. It is common for such vessels to transit between starport and jump point without needing to plot an in-system course but the nature of the current mission means that *Deepnight Revelation* may spend a lot of time moving back and forth between refuelling sources, points of interest or waypoints from which to launch her subordinate craft to investigate a promising site.

With 4g thrust available, *Deepnight Revelation* can make an in-system transit relatively quickly, although there will still be times when it would take less time to jump to the destination. This is not always desirable even if it is quicker, for various reasons. One is continual wear on the drive if used repeatedly; the jump drive can only be overhauled in space so many times before it becomes dangerous to use. Another is the possibility of a misjump or other incident leaving deployed teams or small craft stranded – and the psychological effects on those left in-system whilst the parent ship makes its jump. There are also benefits to proceeding in deep space. *Deepnight Revelation* can collect sensor data, launch and recover craft, and perform maintenance whilst in transit.

Precise transit times are problematic since all bodies in a system are in constant motion. Those orbiting further out from the system's primary travel more slowly and cover a greater distance than those closer in. As a result, the distance between any two bodies can vary considerably over time. It is rarely feasible to travel in a straight line between two points. Instead, a ship's astrogator will set up a course taking account of gravitational forces in a system to intercept a body at a predicted point. Even then, there are additional variables to consider.

Much depends on how committed the Travellers wish to be to their chosen course. A least-time course involves accelerating constantly to the midpoint then decelerating to intercept the target body, making use of gravitational assist from bodies in the system. The problem with this is that changing any variable can mean missing the target by a considerable margin. For example, if the Travellers are on a least-time course to a body but have to cut thrust pick up their small craft, they may find themselves with a great deal of momentum towards a point some distance from the target. Changing vector to make a new intercept may add considerable time to the transit, especially if the original course was very finely calculated.

The Travellers will also have to consider whether they want to make a fast flyby at the end of the transit, enter orbit in a series of spirals that allow time for surface scans or arrive at rest relative to a body or object. This might be done in order to investigate a ruin detected on a planetoid or assist a distressed small craft. A finely calculated flyby course does not allow the Travellers to change their minds and enter orbit; they will have to slow down and come back, so it is common to build tolerance into a course and allow for minor changes.

All these variables would be impossible to model without turning the *Deepnight Revelation* campaign into an exercise in theoretical astrophysics and advanced mathematics. Instead, the Referee can abstract transit times in most cases using a rule-of-thumb measure, as shown on the Transits table. These transit durations assume an efficient but not tightly plotted course, which allows room for some modification.

Transits

Representative Transit	Time
Body to Satellite	1–2 Hours
Short Inner-System Transit	20–24 Hours
Longer Inner-System Transit	30–40 Hours
Mainworld to Outer Edge of Inner System	50–60 Hours
Mainworld to Outsystem Gas Giant	60–80 Hours
Mainworld to Far Outsystem Body	250–300 Hours
Transit between Outsystem Bodies During Close Approach	350–400 Hours
Transit between Outsystem Bodies Whilst on Opposite Sides of the System	500–600 Hours

These figures are extremely general. A transit will need to be longer if a course must be plotted around a large star and may be longer or shorter depending on whether the course 'chases' the target body or moves to intercept it. These base transit times can be modified by the Referee according to circumstance, after which the Travellers can attempt to shorten transit time with good navigation.

Course Plotting

Plotting a course from one body to another requires an Average (8+) Astrogation check. The Effect of this check is applied, along with other DMs, on the Course Plots table to obtain the final transit time. If the check is successful, the Effect is added to the modifiers on the table. If it is failed, the Travellers have set up a poor course that will require correction. How soon they discover this, and whether they have enough margin to make necessary adjustments, will depend on their initial decisions.

Course Plots

2D+ Modifiers	Result
0–	Transit time increased by 75%
1–2	Transit time increased by 50%
2–4	Transit time increased by 25%
5–6	Transit time increased by 10%
7–8	Transit time is unchanged
9–10	Transit time reduced by 5%
11–12	Transit time reduced by 10%
13–14	Transit time reduced by 15%
15–16	Transit time reduced by 20%
17–18	Transit time reduced by 30%
19–20	Transit time reduced by 40%
21–22	Transit time reduced by 50%
23–24	Transit time reduced by 60%
25+	Transit time reduced by 75%

No margin for adjustment:	+4
Minimal margin for adjustment:	+2
Normal margin for adjustment:	+0
Fast flyby course	+8
Flyby and return course	+4
Harsh braking at arrival	+2
Close alignment of course	–2
Perfect alignment of course	–4

A course intended to result in a flyby with no possibility of stopping – such as a least-time course across the system – allows the Travellers to accelerate all the way to the target point rather than beginning to slow down as they approach. Less radical flyby courses require the Travellers' vessel to turn around and come back after a close pass but allow small craft to make a rendezvous or probes to be dropped. Harsh braking means undertaking a dangerous gravity braking manoeuvre or even aerobraking in the target body's atmosphere. Close alignment is the opposite of a flyby course; the Travellers plan to arrive with little or no relative velocity for the smoothest possible approach. This may be necessary when investigating an anomaly or matching velocity with a distressed small craft.

For example, the Travellers have sent their small craft into the inner system whilst they refuel at a system's innermost gas giant. This places Deepnight Revelation *a couple of days behind the craft, giving them time to conduct orbital surveys of the inner worlds. When it is time to move on, the Travellers plot a least-time flyby course with a small amount of margin for adjustment. They do not expect to stop in the inner system but need to slow down enough that their small craft can make a rendezvous.*

The Referee designates the transit as equivalent to the distance between a typical mainworld and outer system gas giant, assigning a nominal 75 hour transit time. The Travellers' Pilot check produces Effect +2 and combined with DM+8 for a fast flyby and DM+2 for small margin, they have total DM+12 on the transit time chart. A roll of 6 gives a total of 18 – transit time is reduced by 30%. Deepnight Revelation *will make her flyby beginning in 52.5 hours. She will have made the transit faster than her small craft, which had to decelerate enough to enter orbit, but the time required to refuel will offset this. Good planning allows efficient multi-craft operations that make use of the delays inherent in refuelling and maintenance but a badly plotted course might have left the pinnaces waiting around in orbit for a couple of days whilst the shamefaced Travellers slowed their ship down and turned back…*

DEEP SPACE MANOEUVRING

Manoeuvring in deep space, far from a significant gravity field, poses severe problems for most vessels. The standard m-drive requires a gravity field to work against and falls off to less than 1% efficiency without one. This is not much of a problem in a star system – enough gravity to keep planets in their orbits is sufficient to run a conventional manoeuvre drive – but between star systems this is a serious liability. It is quite possible for a starship to emerge from a jump relatively close to a refuelling point such as a rogue comet but to be

incapable of reaching it before the onboard fuel and supplies run out.

The drive used aboard *Deepnight Revelation* has been modified to allow it to operate in deep space. Efficiency is still greatly reduced but the ship can produce over 1g acceleration, which is sufficient to manoeuvre close to a deep space wreck or body such as a comet. Once close, the conventional drives aboard *Deepnight Revelation's* small craft will respond to the gravitational effects of a comet or similar body, allowing slow and careful manoeuvring. This is fraught with risk, however, as the already reduced efficiency of the drive will drop off rapidly as distance from the body increases. Careless use of the throttle may result in a craft having too much momentum away from the body for its now-less-powerful drives to reverse. The result is a slow drift into deep space unless *Deepnight Revelation* herself can make a rescue.

Piloting operations in deep space are one difficulty level harder than usual, reflecting the fact that the craft or ship will not react the way the pilot expects. This can result in either applying too little thrust or too much in an attempt to compensate. A failed Pilot check will usually result in a nerve-wracking and careful series of manoeuvres to get back to the starting point for another try, imposing stress and delay but no long-term effects. However, any Pilot check failed with Effect-6 or worse results in either collision with the target object or an un-correctable drift away from it. *Deepnight Revelation* herself does not suffer the latter effect; she can always apply sufficient thrust to alter her vector. However, it may take several hours to undo the effects of a simple piloting error and given the highly dangerous nature of deep space operations this will not endear the pilot to his crewmates.

ORBITAL MANOEUVRING

A stable orbit requires balancing the ship's momentum against the gravitational attraction of the body it intends to orbit. The altitude of the orbit depends on the speed of the vessel. Achieving a stable orbit that does not require additional manoeuvring at some point is very difficult but on most occasions it is not necessary. Quite often *Deepnight Revelation* or her craft will not enter orbit at all but allow the gravitation of a body to affect the vessel's course for as long as necessary.

Gravity-Assisted Flyby: It is possible to remain in proximity to a world for a few hours whilst retaining high momentum by allowing gravitational attraction to curve the path of the vessel without pulling it into orbit. This is useful if the Travellers simply want to pick up small craft or launch probes. It would also ensure that in the event the ship could not manoeuvre for some reason, its velocity would take it away from the world. Typically referred to as a 'gravity-assisted flyby', this manoeuvre is also known as a 'scaredy-cat approach'. A gravity-assisted flyby is simple enough to set, typically requiring an Easy (4+) Pilot check. The difficulty will be higher if a very precise path is required or the gravity well is very steep, such as that of a neutron star.

Gravitational Slingshot: A slingshot manoeuvre is used to gain speed rather than extend the duration of a high-speed flyby. It differs from a gravity-assisted flyby in that the trajectory is calculated to project the ship on a particular course with the highest possible speed and requires greater precision in order to gain best effect. A slingshot also requires passing closer to the target body, which can be hazardous if the course is badly plotted. A slingshot manoeuvre can be used to escape from a gravity well that *Deepnight Revelation* could not simply boost out of on a direct path and might be employed by a ship that cannot maintain constant thrust to reach high speeds. Indeed, a very well calculated slingshot would allow a craft to accelerate from one body to reach another, gaining more speed towards its final destination. A typical slingshot manoeuvre requires an Average (8+) Astrogation check to set an optimal course, followed by a Routine (6+) Pilot check to follow it correctly. Failing the Astrogation check results in the wrong final vector; the Pilot check may result in the vessel passing too close or having to abort the slingshot. Difficulty levels are higher for complex or extremely high-gravity situations.

Powered Orbit: A standard piloting shortcut is to use a powered orbit rather than setting a true orbital capture. A powered orbit is not stable, requiring the vessel to apply thrust from time-to-time – or perhaps constantly in an extreme case. A typical orbital survey can be conducted in a few orbits, so it is not uncommon for a craft to set a course that allows it to remain in orbit with a nudge from the engines every few hours. It is customary in this case to err on the side of too much speed, so the craft will spiral outwards and eventually leave orbit if thrust is not applied but an orbit that will eventually decay and cause the craft to fall to the surface is sometimes necessary. A powered orbit can also be used to maintain an orbital position at a set distance. A powered orbit requires a Routine (6+) Pilot check to set and maintain in most cases. Difficulty, as always, is higher where there are added complexities or very high gravitational fields.

Orbital Capture: A perfect orbital capture is quite tricky and usually achieved by entering a braking orbit, allowing gravity to slow the ship to about the right speed for the intended altitude, then using thrust to alter the orbital path to one that will remain stable for an extended

period. This two-stage method of orbital insertion is standard; trying to make the insertion in one go or with minimal final manoeuvring increases the difficulty of the Pilot check by one level. A Routine (6+) check is needed to enter a stable-ish orbit good enough to keep the ship in position for a few days or weeks. A stable but highly elliptical orbit requires an Average (8+) check, whilst a long-term stable orbit requires a Difficult (10+) check.

For example, the Travellers want to spend a day or two studying a neutron star at a fairly close distance but are concerned about the dangers it poses. They choose to place Deepnight Revelation *in a powered orbit that will require corrections every few hours. That way if something happens to the ship or crew, they will spiral out and escape rather than plunge into the neutron star's surface. The Referee rules that the high gravitational field of the neutron star pushes the difficulty up a level to Average (8+) but this is no problem for the Travellers. Upon leaving they decide to speed up their transit to an interesting dwarf planet they have detected in the vicinity. Setting a slingshot manoeuvre would normally be Average (8+) but the intense gravity field close to the star pushes this to Difficult (10+). The pilot manages to fail this check and the Travellers find themselves on a course that will take them far too close to the neutron star. Their solution is to create a second slingshot on the fly and accelerate towards the star, using its gravity to give them enough speed to escape. They are now headed in the wrong direction at high speed and the language on the bridge is colourful…*

SMALL CRAFT OPERATIONS

Short-range small craft operations are not much of a problem if *Deepnight Revelation* remains in place and acts as a base. In this situation the only complication is handling multiple craft using different docking and hangar areas. *Deepnight Revelation's* craft handling system was created to hold most craft in tight docking areas, with some moved into the full hangars for maintenance or unloading. This can require reshuffling, especially if changing circumstances require moving a half-dismantled or partially loaded craft out of the way to allow another use of the hangar.

It is customary to have at least one docking area free and available for an emergency, and have a pinnace or boat available for instant launch if a rescue is needed. Since *Deepnight Revelation* has two main docking areas on each side – the hangars on the pod caps and the hangar modules themselves – plus a secondary docking area aft on each side, this is not a major problem unless high-tempo operations are required. A traffic system whereby one side of the ship is launching and the other ready to recover craft is customary but much depends on the Travellers' preferences.

Avoiding snarl-ups that will impose delays and might even cause an accident is the business of the officer in charge of small craft operations. An Average (8+) Admin check will suffice to keep things running smoothly most of the time or the general small craft operations undertaken during a Mission can be abstracted using the DEI of the Flight Division. Problems in craft handling can spark Adventures or interesting incidents, whether this is because a craft suffers drive failure in the docking bay or on approach, or reaches its destination with a critical piece of equipment still in the hangar.

If *Deepnight Revelation* is using her small craft to extend her range, for example by sending pinnaces to carry out surveys whilst she refuels, her craft control officers must keep in mind the performance and endurance of the small craft. This is even more important when using the

jump-capable scouts. Good planning will ensure small craft can make rendezvous with their mothership but changes of plan could put them in a position where they cannot catch up or even find *Deepnight Revelation*. The Travellers may find themselves in a position where they have to choose whether to abort an operation to launch search and rescue operations, or abandon their people. Doing so would likely cause a collapse in morale among the crew unless it is the only way to save *Deepnight Revelation* herself.

Small craft operations are integral to the mission and using them well will improve efficiency by a large margin. At the same time, having detached craft in distant locations or other star systems presents the Referee with opportunities to pull the Travellers into Adventures they might otherwise bypass or try to avoid.

PLANETARY OPERATIONS

Deepnight Revelation is not designed for planetary landings or entry into an atmosphere. It can perform an aerobraking manoeuvre in the upper atmosphere of a planet without coming to harm, or skim fuel from a gas giant's atmosphere, but attempting to descend deep into an atmosphere or gravity well may cause damage. This does not make it impossible to land on a planet; *Deepnight Revelation* can hover on her lifters over the surface of a body up to Size 2 or a maximum of 0.15gs surface gravity. A gentle set-down would be possible on such a body if a suitably large flat area could be located but this would be a hazardous undertaking.

Deepnight Revelation has no landing gear, so unless a large part of her underside is supported by bedrock there is always a chance of structural damage. This would be far greater on a higher-g world but the ship would never be able to take off from one. A landing on a world with surface gravity higher than 0.15gs would more than likely take the form of a controlled crash, stranding the ship and crew on a permanent basis.

However, it is possible to escape from a world with more than 0.15gs surface gravity by using the manoeuvre drive. With 4g of thrust available *Deepnight Revelation* can in theory stand on her tail and climb to orbit by brute force, although a less perpendicular climb would be possible if the surface gravity were lower than 4g. So long as the angle of climb is such that the downward component of her thrust is greater than the surface gravity of the world, *Deepnight Revelation* will gain altitude.

Doing this in an atmosphere can be tricky if there is any wind and failing to correct quickly enough could cause the ship to start tumbling downward. However, it is also possible to ride the wave of compressed gas beneath the hull – this is not the same thing as aerodynamic lift but it will offset some gravitational forces – in order to achieve a relatively stable atmospheric flight. This is a highly tricky manoeuvre, requiring a Very Difficult (12+) Pilot check to avoid losing control. Regaining control after it is lost is even more difficult.

A less dangerous – although still fairly exciting – version of this manoeuvre is aerobraking, whereby the ship dips into the upper atmosphere of a planet and uses the resulting drag to slow her down. This causes very high velocity winds at the edges of the ship and compression heating on the surface presented to the air – usually the belly of the ship. Delicate components such as antennae can be torn off or melted in an excessive aerobraking manoeuvre but it is sometimes worth the risk. The navy will occasionally slam a cruiser into a world's atmosphere in what is known as the 'broad hint gambit', making sure everyone on planet knows the navy has arrived. The Travellers may find other uses for the technique, ranging from scrubbing off speed after an unwisely fast approach, to causing a shock wave to stir things up on the ground. In theory, a violent aerobrake could disperse clouds or dust in the air, facilitating small craft operations. A successful aerobrake requires a Difficult (10+) Pilot check. The most likely outcome of a failed check would be a check for Erosion of Capabilities (see page 56), although control loss or serious damage could occur.

Operating in the wispy upper layers of a gas giant's atmosphere is less of a problem. Skimming for fuel at the upper edge of the atmosphere is not much more hazardous than standard space operations, although it is relatively slow. More commonly, a ship wishing to refuel will dive a little deeper, to a point where conditions are more turbulent but there is more gas to be taken in. The overall effect is that Pilot checks are made at DM-2.

Fuel skimming takes a number of 'passes', during which the ship opens its scoops and forces gas into them by moving fast through the atmosphere – or simply pointing scoops into the wind. *Deepnight Revelation* can skim fuel equal to 1% of its hull tonnage per pass, with a pass typically requiring 2D minutes. So, *Deepnight Revelation* can obtain 750 tons of fuel in a single pass or about half this much if the operation is undertaken in the safer upper layers.

A successful fuel skim can be abstracted as a Mission, using the DEI of the Flight Division, whilst a foray deeper into the atmosphere is unusual and hazardous enough to be the subject of an Adventure.

LOCATING RESOURCES

Fuel is the easiest of the necessary resources to obtain. The usual method is to jump to a gas giant in the system and conduct a standard skimming operation. The innermost gas giant is the usual target as this makes the inner system more accessible but if the intent is only to refuel then any gas giant is acceptable. So, systems with gas giants are preferred for convenience when making a fast transit. If *Deepnight Revelation* intends to explore a system without gas giants or no system on the route ahead has one, an alternative source of fuel may be necessary.

Fuel can also be obtained from icy comets or ice-capped moons. A planet with water would be a plentiful source but the difficulty in bringing enough water to orbit in small craft would be considerable. Cracking water into hydrogen and oxygen is a simple task and one that all starships are equipped to handle. Ice-bearing bodies are common in outer systems, where there is little sunlight to evaporate the ice. Locating one can be a problem however.

Planetoid belts and clusters found at the Trojan points of a gas giant's orbit are likely to contain ice-bearing planetoids and many gas giant moons have ice. However, the gas giant itself is a better prospect. If ice is sought in such a region it is more a question of how long it will take to find a useable source than if one can be found at all. If the Travellers need to find a comet or rogue planetoid in a star system they can go about it one of two ways. The first is to simply collect data on the system until the Survey Index reaches 12 (see page 71). At this point they will have plotted the location and likely identity of most bodies in the system, including comets in eccentric orbits. However, this method of finding fuel is highly time-consuming.

Searching for a suitable ice-bearing body in a nearby part of the system is quicker since it is more focussed but runs the risk of finding nothing at all. The Referee may decide there are no suitable comets or planetoids, in which case there is no chance of finding one. However, the Travellers may not know that, so will need to search. This requires using the observatories, gravitic plotting systems and all other sensors to detect or predict the likely location of a suitable body. Finding one (assuming there are any to be found) depends on the density of matter in the system. A successful Electronics (sensors) or Science (cosmology) check at the difficulty shown on the Fuel Source table indicates a body has been found, unless the Referee rules there are none in that area. If so, the Travellers will at least be fairly sure they have established it is a barren zone.

In the case of a barren system (one with no significant planetary bodies), the procedure for finding a comet or similar fuel source is the same as for locating deep space objects.

Fuel Source

System Density	Check Difficulty	Time Required
Extremely Dense	Simple (2+)	1D Hours
Very Dense	Easy (4+)	2D Hours
Dense	Routine (6+)	3D Hours
Normal	Average (8+)	4D Hours
Sparse	Difficult (10+)	6D hours
Very Sparse	Very Difficult (12+)	8D Hours
Extremely Sparse	Formidable (14+)	12D Hours
Barren	Special	–

If the Travellers are looking for mineral resources such as iron, copper or common carbon compounds the same process applies as for icy comets and planetoids. Many chemicals can be obtained from frozen gases or the rocks of a planetoid and *Deepnight Revelation* is capable of processing these into useful compounds. Edible supplies are more difficult to find.

Most worlds with an atmosphere and water – even an exotic or tainted gas mix – will have some kind of life that can be harvested for food, while corrosive and insidious atmospheres are unlikely to yield anything edible. The ideal source, obviously, is a world with a thin, standard or dense atmosphere, and a high hydrographics percentage.

Some worlds are unlikely to yield much in the way of supplies. Desert worlds and those with less than 20% water will probably yield bulk supplies at best. The same is true for very thin and trace atmospheres. Rich sources of supplies are likely only on 'garden' planets and finding one would be good reason to stop in order to completely re-provision. This would also be a good time to conduct major maintenance and allow the crew a rest but the Travellers may not be able to afford the downtime.

Unusually rich supply sources should be implemented at the Referee's discretion, as should locations with exotic or rare materials. Such a find should be the subject of an Adventure or at least special effort on the part of the Travellers to exploit their find. A windfall of delicious and highly nutritious food, or bonanza of necessary materials to replenish the spares lockers, should be a memorable occasion. It is worth keeping the Travellers guessing by sometimes allowing them to make a good find without accompanying problems but on the whole a big payoff should require significant effort to obtain.

C H A P T E R E I G H T

INTERSTELLAR EXPLORATION

Although the mission is primarily aimed at investigating a phenomenon at the destination point, exploration along the way is not only a secondary goal but a necessity. The Travellers are voyaging through uncharted space and must plan their way ahead to avoid having to turn back and retrace their steps when an obstacle is encountered. They will also have to obtain supplies and materials and thus need to search for suitable places to harvest them.

If a transit is to be abstracted (see page 15) then there is no need to create a map. These segments of the voyage are a bit like the journeys between episodes of a TV series – stuff happens off camera until there is an event of sufficient interest to merit close focus. *Deepnight Revelation* will not record much data on these areas, of course, but it is simply not possible to explore every system on the way to the edge of the spiral arm.

If the Travellers intend undertaking at least a cursory exploration of the nearby systems or if they are looking for something specific like a habitable world, the Referee will need to determine the presence of star systems ahead of time. These need not be detailed until the Travellers show an interest in going there. The exception is where an encounter with starfaring aliens or a similar big event is planned, in which case the Referee will need to know where these people come from and what they are doing in the present region.

Star systems can be detailed using the standard *Traveller* rules or the expanded system found in the *Great Rift* pack. The following rules are derived from the latter but optimised to meet the needs of this campaign. Most of the time the Travellers will only want to know if they can get fuel in the star systems between them and their goal. The presence of gas giants is sufficient data for route planning and only if the Travellers decide to investigate further need the rest of the system be detailed.

JUMP PLANNING

The Travellers should, at the very least, plan their jumps before they make them. It is possible to simply jump to the next star system and see what is there but this risks becoming stranded without fuel or supplies. This risk can be offset by retaining enough fuel to jump back but this would greatly slow *Deepnight Revelation's* rate of advance. The safest and most efficient option is to use available data to predict conditions in the target system – or several potential target systems – and plan a jump to the most suitable point.

Navigational planning can be done over short or long distances. There is no point in making a detailed plan to cover hundreds of parsecs, because it is certain to be derailed at some point. However, general goals can be set over long distances, with more specific objectives along the way.

The Travellers must select a suitable endpoint for their current navigational planning. This can be quite vague, such as a subsector, or a particular navigational reference point. The next stage is to select waypoints that may be equally general if the goal is simply to get closer to the mission destination or could be specific if the Travellers want to reprovision, investigate a world or carry out some other task. The chain of waypoints indicates a general route but exactly how to get from one to the next will require some additional planning.

Once the general route is laid out, the Travellers can select specific systems to pass through. If the goal is simply to keep moving, the system will normally be chosen on the basis of likely fuel availability. If the Travellers are hoping to reprovision or defatigue they may choose systems likely to have habitable planets. They may also want to visit systems thought to have some interesting phenomena or even inhabitants.

It is not possible to be certain what a given system will hold but reasonable predictions can be made about what is likely using data gathered remotely. *Deepnight Revelation* constantly absorbs a wealth of information about stellar emissions and their reflections from nearby planets, gravitational conditions and perturbation by unseen objects and optical/thermal data from the surrounding systems. This information is often patchy and very basic but with a powerful computer correlating it all with known and observed data, a little will be known about the nearby systems for sure and reasonable predictions can be made. The Travellers can thus plan their jumps with a reasonable certainty of obtaining fuel

at the far end and some idea of what they are getting into. That does not preclude the occasional unpleasant surprise, however.

SURVEY INDEX

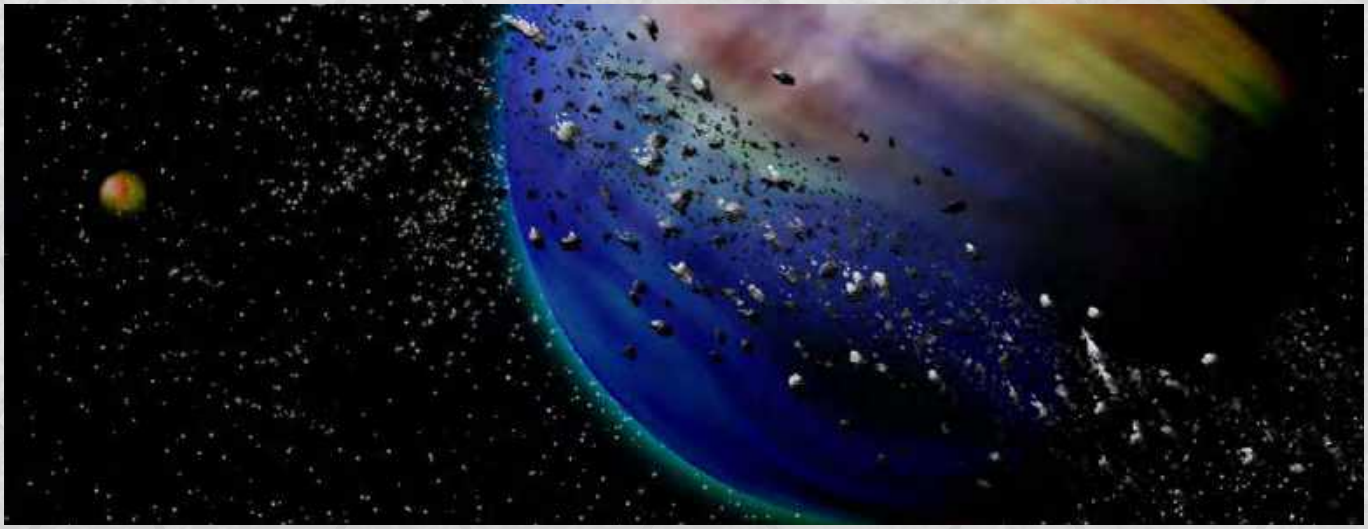
Survey Index (SI) is used to indicate how much data the Travellers have on a given star system and how accurate it is likely to be. This data is not necessarily 100% accurate but errors will be within the bounds of possibility. For example, if the presence of a main-sequence star is indicated by the Survey Index then one will be there but it may not be of the expected type. A predicted yellow main sequence star might turn out to be an orange subgiant but it is very unlikely that a black hole will be present instead.

The Survey Index can be used by the Referee as an indicator of what is known about a distant star system. The Travellers' star chart will usually contain enough data to give an SI of 1–3 on any given hex. If the Travellers indicate an interest in a hex, roll D3 to determine how much is known before a remote sensor sweep is undertaken. If the Travellers intend operating in a region for any length of time the Referee can keep a record of the Survey Index of each map hex, which provides a quick indication of how much the Travellers know about it.

Note that *Deepnight Revelation* has sensor systems – such as its gravitic analysis suite – that can automatically provide some of this data. However, such systems require time to gather data. If the Travellers

Survey Index

Survey Index	Known Data
0	No Data
1	Presence of stars, if any. Presence of other major phenomena such as Black Holes
2	Presence of stars and general type (giant, main-sequence and so forth)
3	Presence and type of stars
4	Presence and type of stars, presence of brown dwarf sized bodies
5	Presence and type of stars, presence of gas giant sized and larger bodies
6	Presence and type of stars, presence of terrestrial (rocky) planets and larger bodies, presence of planetoid belts
7	As above plus general planetary conditions such as presence of an atmosphere and surface water
8	As above plus reasonably accurate estimate of first three planetary profile digits (size, hydrographics and atmosphere)
9	As above plus correct first three planetary profile digits. Reasonable estimate of population and tech level
10	Full planetary profile data
11	Detection of rogue planetary bodies associated with the system
12	Detection of rogue cometary bodies associated with the system



decide to halt and make a gravitic survey of the region ahead, or use some other system that automatically detects objects within a certain region, the Referee should assign an appropriate Survey Index value to the target systems. For example, if a gravitic survey automatically detects objects of gas giant size and smaller in the target area, all systems in that region will be set to a Survey index of 5.

DISTANT SENSOR OPERATIONS

Deepnight Revelation can detect the presence of stellar objects (stars, black holes and the like) automatically, although sweeping a very large area will take a long time. However, a star map was available at the time she left her base, which had been compiled over quite literally centuries. Thus the Travellers are automatically aware of stars in their area of interest unless there is some reason they would not be. Stars may be hidden by nebulae or could have remained undetected because a star in the same system outshone them. Star charts can also be wrong, in which case direct observations of nearby stars will indicate discrepancies.

Within Charted Space, the navigational databases contain detailed information on every star and usually its planetary system too but beyond the frontiers little will be recorded but stellar type and size. Thus the presence of a stellar body, likely but not certainly accompanied by its type, will be indicated on the Travellers' starmap.

More can be discerned by a remote sensor sweep. *Deepnight Revelation* has a specialised exploration sensor suite designed to enable multiple systems to be scanned at once. The suite generates up to six Scan Points per day, depending on the number of researchers assigned. One point is generated per researcher who is doing nothing else but since the work is largely automated this can be an unskilled person simply following instructions and asking advice when something unusual presents itself. Most of the time it can be assumed that if a functioning Mission Division exists, the remote survey suite can be suitably manned.

When the Travellers begin surveying a system, the Referee should roll 2D. This is the amount of Scan Points needed to complete the survey. Scan Points can be allocated to one sweep at a time or used to complete several once. For example, whilst *Deepnight Revelation* is exploring one star system the Travellers decide to survey three others nearby, requiring 3, 6 and 11 Scan Points respectively. They assign some crewmembers to do the unskilled work and a space science expert to guide them and continue the scans while they spend five days exploring the current system. They thus have five Scan Points allocated to each system. This allows the Travellers to complete the survey of the first, which does not look promising. It is reasonable to assume the sensor equipment freed up by the completed survey was assigned to the others (alternatively the Travellers could begin a new sweep), so this means six points have been allocated to each of the remaining sweeps. This means the second is complete and seeing how promising it looks the Travellers decide to move on without completing the third sweep.

A sweep need not be resolved as a Mission but is instead a skill check made using the Effectiveness Index of the Division carrying out the tasks or with Electronics (sensors) skill if a Traveller does it personally. Difficulty will usually be Average (8+) but there may be considerations such as trying to penetrate a nebula, which will push this difficulty level up. This difficulty level assumes a military or advanced starship sensor suite. Standard sensors such as those used aboard vessels intended for operating in well-charted space would suffer a –2 DM but *Deepnight Revelation* gains a +2 DM on the check for her extensive scientific sensor suite.

A successful remote sensor sweep adds twice its Effect to the Survey Index for the target system. An SI of 5 or more indicates the presence of gas giants in the system – if there are any – and that fuel can be obtained there without undue difficulty. This may be all the Travellers want to know when planning their jumps and good time management when passing through other systems will allow a map of refuelling points on the route ahead to be maintained.

POSITIONAL CHECKS

Positional data is based on references taken to known points. These are typically strong radio sources, bright stars and phenomena such as nebulae. Automated systems and the crew routinely check and update position based upon these references and an element of dead-reckoning. This means that if the vessel has jumped from system A to system B, a distance of three parsecs, the initial positional check is based on expected data. A misjump or some other circumstance that results in a different relative position, changed doppler shift or other variance in this expected data will inform the crew they are not where they expected to be – or that circumstances have changed – almost immediately.

The search for reference points proceeds from the most generally useful, such as very bright stars that can be seen at a great distance, through secondary and regional reference points to local stars the ship has collected data on. Ordinary main-sequence stars and minor phenomena are not normally included in the

Check	Time	Notes
Routine Check	D3 minutes	The routine check quickly examines preset reference points and references with expected data to confirm position.
Detailed Routine Check	2D minutes	The detailed check searches for preset reference points or indications of occlusion with the intent of confirming an expected position.
Close	4D minutes	A Close check searches nearby bodies including stars in the current and nearby systems. These would not normally be used as points of reference unless they are notable for some reason but routine navigational data collected during the past few jumps will establish position relative to these bodies if they are within six parsecs.
Local	2Dx10 minutes	A Local check covers an area roughly the size of a subsector around the ship. If any known bodies are identified, relative position can be calculated.
Sector	2Dx30 minutes	A Sector check covers an area roughly the size of a sector with the ship at the centre. Thus if known bodies are located within 20 parsecs in any direction, position can be determined.
Distant	3D hours	A Distant check searches for any known reference point within 100 parsecs, accounting for doppler shift and other distortion of the data.
Full	1D days	A Full check searches for any known point at any distance and attempts to account for distortion of the data to find possible matches. A Full check will eventually find enough possible matches to make a general positional estimate that can then be refined over another 1D days.

navigational databases but any star the ship has passed within six parsecs of will be routinely scanned and added to the temporary local reference files.

It might be that some reference points are occluded by other bodies, or perhaps a nebula, and that a more detailed search will identify enough reference points to confirm position, along with an indication of why the initial positional check produced a worrying result. If not, the detailed search will produce results based on those reference points that can be found. These are grouped into the following categories:

Times are from the moment the positional check begins, assuming it is continued until a result is obtained. Thus if the Travellers misjump or are somehow unable to discern any reference points they will know within 12 minutes at most they are not where they expected to be. Within 24 minutes they can be sure they are not within six parsecs of a system they have previously passed through. The process continues until a known reference point is located or enough possible matches are found to make a reasonable prediction. There are various reasons why this process might be interrupted or corrupted, such as sensor interference or a malfunction, perhaps leading the Travellers to suspect they have misjumped when in fact something quite different has occurred.

SYSTEM SURVEYS

Even if the Travellers intend to pass quickly through a system, they will usually perform at least a cursory survey. More detailed surveys have a better chance of producing accurate information or detecting remote and small objects such as rogue comets or dwarf planets in a planetoid field. Three kinds of survey can be carried out: Passive, Active and Full. Only the largest increase to SI is used, so if an Active survey adds two to the SI and is followed by a Full survey that adds four, only the four is added to SI.

System Survey: Passive

Upon emerging from jump, a system survey is normally performed immediately. If the Travellers suspect danger this may begin with passive data collection. A passive survey collects data on the system's star or stars and can make an estimate of the number and type of other bodies in the system. This uses data from light and radiation reflection and an estimate of the mass of any detected bodies, which in turn allows the presence of some other objects to be inferred. A passive survey is not very detailed but can be undertaken in minutes without using active sensors. A passive survey takes 2D minutes and adds one to the Survey Index for the system.

System Survey: Active

An active survey can be undertaken without moving around the system but requires the use of active sensors that will reveal the presence of *Deepnight Revelation* to any vessel or installation capable of receiving those signals. An active sensor sweep collects more and better data on the presence of bodies in the system and their conditions. An active survey takes 2D hours and adds D3 to the Survey Index for the system.

System Survey: Full

A full system survey requires changing position to triangulate and corroborate data, and to see occluded objects. A full survey does not need to approach any planet closely and can be conducted during a transit across the system. For example, an initial active survey shows the presence of a gas giant so the Travellers decide to visit it with the intent of exploring its moons and refuelling their ship. On the way they take a dogleg course allowing sensor sweeps from different positions and perhaps permitting objects initially occluded by the star or planets to be detected. A Full survey takes 4D hours and adds 1D to the Survey index for the system.

System Survey Outcomes

It is quite possible that after remote senor operations and a survey once they arrive the Travellers will know everything they need about the system. A high SI value indicates the Travellers have learned how large bodies are, whether they have water or an atmosphere and so forth. The Referee should apply common sense to this data; if the survey was conducted in the inner system, the inner bodies will all be in range for good sensor data. In the outer system, where objects are further apart, less concrete information is available and inferences have to be made.

This can lead to the Travellers making minor errors like assuming a body has an atmosphere (because those previously studied with similar characteristics did) only to find that it does not when they approach. Very little data is required to prevent larger misconceptions, such as believing a gas giant has been detected when in fact the target is a small rocky planet. Errors of this sort can happen with limited sensor data however. A small but very dense body might be assumed to be a gas giant based on its gravitational effects on other planets and planetoids but as soon as information is available about stellar radiation reflection or other non-gravitational phenomena the prediction will be altered to fit.

If the Travellers want to know more about a particular body they will have to approach to orbital distance and conduct a planetary survey, or send a small craft to do so. Likewise, the Travellers are unlikely to detect distant bodies in an eccentric orbit unless they specifically look for them.

Each 1D days in-system, 1 is added to SI assuming *Deepnight Revelation* is continuing to collect sensor data. This will eventually lead to a complete understanding of the system and tracking of all its bodies. If the Travellers want some aspect of this data more quickly they can plan a Mission to get it, for example moving the ship above or below the system's ecliptic and scanning for rogue bodies in locations suggested by the system's gravitational interactions.

LOCATING DEEP SPACE OBJECTS

The Travellers may wish to search for objects outside a star system for various reasons. The most likely is in the hope of finding a refuelling point that will allow a rift to be crossed but it is also possible they will find themselves seeking a lost planet, drifting wreck or other deep space object. Objects with a large gravitational field or which emit heat, light or radio-frequency signals are relatively easy to find with *Deepnight Revelation's* powerful sensors. Smaller, non-emitting objects are extremely difficult even for a dedicated exploration ship.

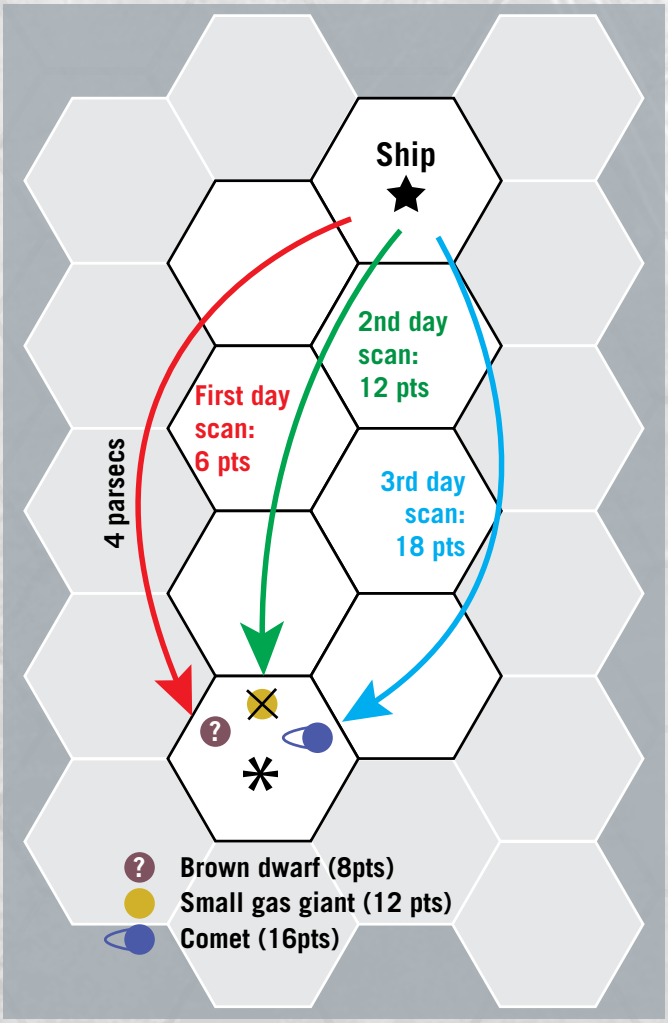
Deep space comets and rogue planetoids are the best prospect for refuelling during a rift crossing. These bodies are termed 'rogues' as they do not belong within any star system. They may have been wandering through deep space for millennia. The System Survey process detailed above deals with rogues that are in close proximity to a star system – in cosmic terms at least. Finding deep space objects requires searching a much larger volume of space with no gravitational interactions to give a clue as to the general area to search.

The Survey Index is used when searching deep space for rogue objects, representing all the methods the Travellers might use. The search is on a hex-by-hex basis, in the same manner as surveying a star system. A minimum Survey Index for any given hex is required to locate objects within it. This is modified by the distance from the scanning vessel.

Body	SI to detect
Star or other Stellar body	Automatic
Brown Dwarf Sub-Stellar Body	4
Large Gas Giant	6
Small Gas Giant	8
Planetary Sized Body	10
Cometary Body	12
Per Parsec Distant	+1

Deepnight Revelation is a very well equipped exploration ship. Using its full resources it can produce six scan points per day. This allows six hexes to be searched for deep space bodies at once or several points to be added to the total for any one hex. Once the relevant total SI is reached for a given body the Travellers can be reasonably sure they would have detected a body if it were present. There is always some uncertainty of course, especially if the Referee knows a reason why an object would not be picked up on a deep space scan.

For example, the Travellers are scanning a hex 4 parsecs distant, looking for a possible source of fuel. They use the ship's full resources and assign 6 Scan Points to the system. At the end of the first day the total is 6 but at a distance of 4 parsecs the Travellers would need 8 Scan Points to detect a brown dwarf sub-stellar object. The next day the total is 12. This is enough to detect a small gas giant at 4 parsecs' distance so the Travellers can be reasonably sure there is no such object in the hex. Another day of scanning brings the total to 18, which is more than the 16 required to locate a comet at 4 parsecs. The readings indicate the presence of several such bodies in the hex, along with their location and interstellar velocity. The Travellers are reasonably sure there are no larger bodies in the area, as their scan would have found any that existed. However, there are several comets that might serve as refuelling points and one in particular is interesting. It has an unusually high interstellar velocity, suggesting it has an interesting history. Of course, it might not be a comet at all. A planetoid-hulled generation ship is very similar in size and characteristic to a large comet....



SHORT-RANGE DETECTION

Occasions may arise where the Travellers need to detect comets or other objects in deep space from a relatively short distance. For example, a misjump or an incredible leap of faith might place *Deepnight Revelation* in an 'empty' deep space hex. If so the Travellers will need to find a source of fuel as quickly as possible.

The Referee should determine if there are any objects within range of the scanning vessel. When jumping blindly into a hex this is a matter of chance – a single map hex represents such a gigantic expanse of space that even a star system occupies only a small proportion of it.

The table below indicates how many objects, if any, exist within the scanning vessel's vicinity. The following DMs apply:

+2 if the scanning vessel is in a map hex where an interstellar object such as a rogue planet is known to exist.
+4 if the scanning vessel is in the same map hex as a star system but is not within that system. For example, in the Sol system a ship that has gone far out past Pluto and the Oort Cloud but has not left Sol's map hex would gain this DM.
+6 if the scanning vessel is within the Oort Cloud.
+8 if the scanning vessel is within the Kuiper Belt.
–1 per parsec to the nearest star system.

2D	Objects Within Range
7–	Nothing detected within range
8–9	One object within range
10–11	1D3 objects within range
12	1D objects within range
Each +1 above 12	One additional object within range.

The lack of any objects within range does not mean the hex is definitely empty. There are limits to how far a ship's sensors can reach and still produce useful data on a reasonable time frame. A sweep of this sort takes 1D days and covers a volume of space equivalent to a typical star system's planetary zone and Kuiper Belt. This is a spherical region of space around 50AU in radius.

A three-dimensional grid search of an entire map hex, constructed at 100AU intervals, could identify and map every single object within that hex. Such an undertaking is not feasible however. A one parsec map hex is over 200,000 AU across in each direction. Thus 2,000 scans would be required just to map a 50AU wide strip across the hex. If the Travellers are in such dire straits they need to try this, something has gone very wrong indeed.

Nature of Objects Found

For each object detected, the Referee should roll 2D on the main part of the expanded table below. Results of 2 or 12 require an additional roll on the extended section.

Highly unusual large rogue bodies might include particularly dim brown dwarfs, perhaps with their own moon or planet system, pairs of large bodies orbiting one another as they pass through deep space, or something even more unusual such as the burned-out shell of a dead star.

Extremely unusual objects should be treated with caution as they may be setting-changers. For example, if the Travellers find half a planet drifting in deep space with the shattered remnants of cities on its surface, then some cataclysmic event must have occurred to cause this. If the Travellers want to investigate the Referee will need to have an explanation, which in turn may require introducing new themes to the game setting.

Extended Roll	Primary Roll	Result
1	2	Extremely unusual object
2	2	Drifting interstellar wreck
3	2	Dangerous object such as a relic from an ancient war or inhabited cometary body
4	2	Increased gravity or radiation with no obvious source
5	2	Planetoid or cometary body with signs of long-ago habitation
6	2	Unusually dense gas cloud
	3–4	Sensor Glitch; nothing present
	5–9	Tiny ice-bearing comet suitable for one refuelling only
	10–11	Ice-bearing cometary body suitable for multiple refuellings
1	12	Large Cometary Body
2	12	Rogue Dwarf Planet
3	12	Rogue Planetoid Cluster
4	12	Rogue Planet
5	12	Rogue Gas Giant
6	12	Highly unusual large rogue body

CHAPTER NINE

PLANETARY EXPLORATION

Detailed exploration of any body is referred to as 'planetary exploration' in these rules. This can be something as simple as making a flyby with a probe or might be a major undertaking like a detailed examination of a world's ecosystem by landing parties.

PLANETARY SURVEYS

Surveying an entire planet is a huge job, so typically a data sample will be taken and extrapolations made from it. These are usually fairly accurate but that does not mean everything is known about a surveyed planet after a couple of days on the surface.

Preliminary Planetary Survey

A preliminary survey can only be carried out at the target location. This means orbital distance for most planetary bodies or within a few thousand kilometres for other objects such as drifting wrecks. The duration of the survey depends on the nature of the object being surveyed.

Surveying a small object such as a comet takes 2D minutes. A preliminary survey of a planet-sized object takes 4D hours. 12D hours is required to survey a larger object such as a gas giant or brown dwarf. A successful survey requires a Routine (6+) check using the detachment's Efficiency Index or Electronics (sensors) skill if personally carried out by a Traveller.

A preliminary survey provides information on size, composition and characteristics of an object, and will detect obvious signs of life in the case of a planet. It will usually be possible to predict the population size and technological sophistication of an inhabited world and to gain a good indication of climate and ecological conditions whether or not there are people present. The survey might be misleading, however. What looks like a verdant plain could be a marsh and dangers such as earthquakes or aggressive animals will not always be apparent from a distance.

At the end of a preliminary survey the Travellers will know:

- Planetary size, hydrographics and a reasonable estimate of atmospheric composition.
- The presence or otherwise of plant and animal life.
- The presence of a civilisation that is not concealing itself or an outpost that is obvious or actively advertising its presence.
- Whether extreme conditions such as heavy volcanism or severe storms are likely.
- Any very obvious characteristics, such as the presence of an unusually strong magnetic field or high levels of radiation in some areas.
- Anomalous characteristics such as an orbit that is unlikely to have occurred naturally, or the presence of life on a world not old enough to have evolved it.

Some things may be missed by a survey. An underwater civilisation is unlikely to be detected on a cursory survey and very primitive life might well be overlooked. On the other hand, large radioactive craters in what would be logical locations for cities will stand out on the most cursory examination.

Detailed Planetary Survey

A detailed survey includes mapping of at least the major surface features, collection of atmosphere, liquids and biological samples, and some analysis work. A detailed survey of a planet-sized body takes 3D days for a detachment of around 20–30 personnel; a planetoid belt takes three times as long whilst a smaller body such as a single comet takes only 2D hours.

Once the survey is completed an Easy (4+) check is made using either the detachment's Efficiency Index or a Traveller's Science (planetology) skill check if they are leading the expedition personally. If successful, the Travellers are assumed to have solid and fairly comprehensive data on the body. This does not mean everything is known, of course. The Travellers will know there are ruins of a TL5–6 civilisation present but will need to investigate further to find out about the people who left them. They will know the object is a spacecraft component blasted off by combat damage but they will not be able to tell who built the ship or exactly what happened to it.

A detailed survey is not the same thing as fully exploring a planet. It produces a general map and information on likely conditions but to find deposits of mineral resources or to fully understand the local ecosphere

will require significant time on-planet. However, as a general rule a detailed survey will allow a world to be categorised and will indicate whether there is something worth further investigation. The presence of currently occupied cities will be obvious unless they are deliberately concealed. Ruins may not be so clear but the Travellers will be aware of points of interest that bear further investigation.

At the end of a detailed survey the Travellers will know:

- Planetary size, hydrographics and atmospheric composition, with good accompanying data on surface gravity, oceanic salinity and trace elements in the atmosphere.
- The general nature of plant and animal life, and how the local ecosphere fits together. There may, however, be some puzzling gaps.
- The presence of a civilisation that is not taking extreme measures to conceal itself or other inhabitants, along with a strong indication of whether they are indigenous or originated elsewhere.
- A good model for tectonic activity, volcanism and weather patterns, along with data on climate in the past and an indication of likely conditions in the future. For example, if a world is entering an ice age this may be revealed by a detailed survey whereas a preliminary one will simply give an indication of current conditions.
- An overall general model of the world's characteristics sufficient to plan short or long term expeditions.

The detailed survey is still general in nature. Prospective colonists would want surveys of likely sites and detailed groundside exploration – you do not really know a planet until you have lived there, at least for a few days. Likewise mining companies would want more work done on prospective sites and a suitable set of samples to analyse. For the Travellers, a surveyed world might still hold some surprises if the crew decide to go hunting or take some R&R there.

PLANETARY EXPEDITIONS

Larger-scale or more closely targeted expeditions may vary in duration and nature. An expedition needs some experts in a suitable field plus enough pairs of hands to support their work plus personnel to handle transport, record-keeping and a security element. The latter may be more concerned with rescuing experts from holes they have fallen in or wrangling a stuck vehicle out of the mud, than combat but it is always a wise precaution to include a few personnel whose job is to keep everyone else safe.

An expedition needs to be large enough to get the job done on a suitable time frame. Something simple like collecting soil and water samples might be handled by a single person, although sending anyone out alone on an unknown world is asking for trouble. Investigating a large ruined city will require several exploration parties plus perhaps a scientific follow-up team to look over anything interesting. The table below gives an indication of the size of party required and the time taken to carry out the mission. This does not include transit times – if the target location is on the other side of the planet the Travellers will have to coordinate transportation, possibly making some of their pinnaces and boats unavailable for other tasks.

These figures are guidelines only. As a rule, time required to complete an expedition increases by 50% for every 20% shortage in personnel and is reduced by 10% for every 25% extra personnel assigned, unless more people would be counterproductive. Relatively few personnel might be carrying out the primary purpose of the expedition; the rest are lugging sample boxes, preparing meals and maintaining regular radio contact with the parent vessel.

Example Expeditions

Nature	Example	Time	Number of Crewmembers
Small, Simple	Sample collection in the local area	2Dx5 minutes	2
Large, Simple	Sample collection over a wide area	2Dx10 minutes	12
Small, Uncomplicated	Geological survey and core samples in a small area	2Dx15 minutes	6
Large, Uncomplicated	Geological survey and core samples at several sites	2D hours	16
Small, Moderately Complex	Examining and recording carvings on a rock face	3D hours	4
Large, Moderately Complex	Compiling a database of local plants and animals	2Dx3 hours	20
Small, Complex	Exploring a small ruined settlement	3D hours	6
Large, Complex	Exploring a section of a ruined city	2Dx6 hours	24

CHAPTER TEN

SCIENCE & OTHER RESEARCH

The Travellers will undoubtedly engage in a range of scientific research during their voyage. Some will be general in nature, such as working through the data gathered about local stars' radio emissions and will advance the Travellers' knowledge without being directed at any specific goal. Other research projects will be aimed at solving particular problems or investigating items found along the way.

Deepnight Revelation has numerous laboratories and workspaces that can be used as one, so can have teams working on different projects. It can be assumed that the Mission Division conducts general research on a continual basis and will make reports to the command staff from time-to-time. The Referee can use this general research to present adventure leads or information relevant to the storyline of the overall mission. There is no need to track this general research, although it will be interrupted if the Travellers pull personnel off to carry out other tasks – including targeted research.

When the Travellers wish to carry out a targeted research project, the Referee must decide what category it falls into and how difficult it is going to be. Some things are beyond the scientists on the mission, such as inventing a new kind of long-range jump drive but if the Travellers want to assign people to this sort of impossible task they will work on it – under protest – and will not be available for other projects.

Deepnight Revelation sets out with enough experts and research assistants to form one research team in each of the following fields, although it is only possible to embody a total of three teams at once without reducing or curtailing general research. Personnel not currently working on a project in their specialist area will help out as best they can or assist with the donkey work of data collation, sensor calibration and other routine tasks.

The expert areas of the personnel aboard *Deepnight Revelation* correspond to the following categories:

Ship: Research and problem solving connected with the ship, such as finding a way to fabricate necessary components to bring the jump drive back up to full capability.

Space: Space science projects such as predicting the location of a drifting wreck or figuring out why a particular star emits strange radio frequencies.
Physical: Analysing minerals or strange alien alloys or trying to explain electromagnetic phenomena.
Life: Figuring out an alien ecosystem, studying a creature or solving a medical problem aboard *Deepnight Revelation*.
Social: Explaining an alien society, figuring out an alien language or determining a solution to internal crew troubles aboard *Deepnight Revelation*.
Special: Almost any field of research prompted by a discovery, such as studying an artefact to determine what it does and how to use it.

A properly formed scientific team produces 2D Research Points per day assuming it has an adequate place to work. As already noted there are sufficient personnel at mission start to run three research projects (in different fields) at a time. If the Travellers want a second team in the same field, one can be created by pulling in everyone with relevant knowledge. This weakens the primary team such that 2D-2 Research Points are produced each day and the secondary team produces only 1D points per day. Forming a tertiary team in the same field weakens the secondary team to 1D-1 Research Points per day and generates D3-1 points per day in its own right.

If the Travellers need a lot of research done quickly they can form a fourth team by pulling personnel off the general research project. A weakened primary team can then be assigned to a field not currently being explored by another team, or a secondary team can be assigned to an area whose experts are already in use. At the cost of completely halting general research a weakened secondary team can be assigned to any area, in addition to any personnel already working there.

Research Teams

Type	Research Points Per Day
Primary	2D
Weakened Primary	2D-2
Secondary	1D
Weakened Secondary	1D-1
Tertiary	1D3-1

For example, the Travellers currently have research teams working in the Life Sciences (trying to make the unpalatable resources harvested recently acceptable enough to prevent a loss of morale) and Social (trying to figure out inscriptions found whilst harvesting near-inedible plant materials) fields when they encounter a strange electromagnetic phenomenon, which leads them to what appears to be an alien wreck. Aboard is a creature – possibly a crewmember – in suspended animation and artefacts that may be cargo or components.

The Travellers decide to prioritise study of the creature and put their third research team on it. This is a Life Sciences project and they already have one in progress so they downgrade the food project to secondary (reducing Research Points per day to 1D) and set up a primary research team to see if they can revive the alien. This team is weakened by the need to keep someone competent on the food project and generates 2D–2 Research Points per day.

Curtailing General Research

General research is important to the mission in both the long and short term. In the longer term, the whole point of the voyage is to learn more about the universe and whilst the crew will accept a necessary slowdown or even complete stop for a while they will start to question the point of continuing the mission if no science being done. So, slowing or curtailing general research must be 'sold' to the crew with an Average (8+) Leadership or Persuade check for a slowdown and a Difficult (10+) check for a complete curtailment. The crew will accept the situation for a number of weeks equal to the Effect of the check, after which a minor MOR check is required at the start of each new week. If the check is failed, a major MOR check is necessary immediately and at the start of each new week in which full general research is not undertaken.

In the shorter term, general research provides a constant flow of information on nearby stars and star systems. Curtailing this does not impair navigation but may result in useful or important data being missed. The Travellers might arrive in a system to find things are not quite as expected or that they lack some important piece of data. The Referee may choose to impose an Incident during any Mission launched whilst general research is curtailed or slowed.

ORGANISING AND CONDUCTING RESEARCH

When a research project is implemented by the Travellers the Referee should decide on its field and difficulty, and whether it has additional requirements. Many research projects are self-contained, such as decoding an inscription found on a cave wall or figuring out how to fabricate a replacement jump drive component. This sort of project is termed **straightforward**. It may be long and difficult but does not require experts from multiple fields or facilitation work before actual research can begin. Other projects are more convoluted, sometimes requiring subprojects to be completed before the final result is obtained. These are termed **complex** projects. A complex project may have elements of varying difficulty and field.

SIMPLE RESEARCH

Deepnight Revelation has enough facilities and personnel to produce 2D research points per day in each of up to three areas and conduct general research at the same time. The simplest way to conduct research is to prioritise tasks and assign a team to each project as the last one is completed. However, at times it may be desirable to conduct several projects at once in the same field or halt a project in order to solve a new problem. The Travellers can wring a few more Research Points per day out of the Mission staff by good project management – like everything else, improved results depend on how much attention to detail the Travellers are willing to spend time on.

Research projects are resolved by tracking the number of Research Points allocated to the programme. Once the number of points reaches the Breakthrough Threshold for the project, as shown on the Project Length and Difficulty table, the Traveller in charge of the project may make a Science check at the appropriate difficulty level. The Traveller's highest Science skill is used even if it has nothing to do with the project's field, as this skill level represents the ability to coordinate effective research and use specialist knowledge provided by someone else. A Traveller may only head as many research projects as their highest Science skill level, so it may be that a low-priority project is placed under the control of someone with no scientific background. In that case the usual unskilled penalties apply.

If the check is made, the project has achieved a breakthrough. In many cases this will be sufficient to complete the project but some programmes require several breakthroughs to be successful. These are termed **Extended** projects. A breakthrough in an extended project is a landmark for the team and worthy of note, and may yield information the Travellers find useful. If a breakthrough check is failed, the process begins again and Research Points must be once more accrued and assigned. The next check for a breakthrough is one level of difficulty lower, reflecting lessons learned during the failed research cycle.

Project Length and Difficulty

Descriptor	Research Points Per Breakthrough	Science Check Difficulty
Length		
Quick	2	
Short	4	
Typical	8	
Lengthy	16	
Very Lengthy	32	
Long-Term	64	
Difficulty		
Simple		Simple (2+)
Easy		Easy (4+)
Routine		Routine (6+)
Average		Average (8+)
Difficult		Difficult (10+)
Very Difficult		Very Difficult (12+)
Formidable		Formidable (14+)

Nomenclature for straightforward research projects is as follows: Project Title, Field, Length (Research Points per breakthrough) and Difficulty, as demonstrated on the Example Projects table. For lengthy projects it is necessary to add the notation Extended and a bracketed number. This is the number of breakthroughs required. The number can be a specific value or the dice to be rolled if it is possible there may be considerable variance.

For example, a Traveller is trying to figure out how to fly an alien spacecraft and needs 2D breakthroughs. The time between attempts is short but the chances of each attempt being successful are low. However, each failed breakthrough reduces the difficulty of the next by one level, so the Traveller will probably succeed sooner or later.

Complex Projects

Complex projects need to be laid out as a series of subprojects. For example, the Travellers decide they want to create a research team up to figure out as much as possible about the aliens who built an outpost, learn about their technology, translate their language and decipher their records to find out what happened to them. This is four subprojects in different fields all forming part of a larger project.

General Information and Groundwork: (Special), Typical length, Average (8+) Difficulty.
Comprehend Technology: (Physical), Lengthy, Average (8+) Difficulty.
Details of Alien Physiology: (Life), Lengthy, Average (8+) Difficulty.
Translation of Language: (Social), Lengthy, Extended (2), Difficult (10+) Difficulty.
Decipher Records: (Social), Short, Average (8+) Difficulty.

The physiology, technology and translation projects can be completed in any order but the deciphering of records is obviously dependent on being able to read them. None of these tasks can be begun until the researchers have

Example Projects

Project Title	Field	Length	Difficulty
Determining how to fix a damaged ship component without standard spares	Ship	Typical (8)	Routine (6+)
Preparing a detailed repair and overhaul plan	Ship	Very lengthy (32)	Average (8+)
Determining if a radio signal is of intelligent origin	Space	Short (4)	Routine (6+)
Creating a model for the gravitational effects around a black hole and determining safe approach distance	Space	Lengthy (16)	Difficult (10+)
Analysing a compound of unknown origin	Physical	Short (4)	Average (8+)
Finding a use for a new alien compound	Physical	Long-Term (64)	Average (8+)
Diagnosing an illness of alien origin	Life	Typical (8)	Average (8+)
Devising an effective treatment for an alien disease	Life	Lengthy (16)	Difficult (10+)
Figuring out an inscription in an entirely unknown alien tongue	Social	Lengthy (16), Extended (3)	Difficult (10+)
Deciphering an alien language from an inscription	Social	Very Lengthy (24)	Very Difficult (12+)
Devising a specialised shield to protect against a psionic alien's attacks	Special	Lengthy (16), Extended (4)	Difficult
Figuring out how to fly an alien starship	Special	Quick (2), Extended (2D)	Very Difficult (12+)

done the basic groundwork represented by the first part of the project. Once all subprojects are complete the Travellers will know all about these aliens; their physical nature, an indication of their culture and even their language. The Travellers will recognise and be able to operate their technology if encountered in the future.

RESEARCH EVENTS

Research Events occur any time a project succeeds with Effect+0 or at the discretion of the Referee. A Research Event can be imposed if the Travellers try to rush a project or it is disrupted by circumstances such as a need to drop everything and conduct damage control operations or take part in a groundside expedition. Events can be positive or negative.

A Research Event is determined by the Investigate skill of the Traveller heading the project, as shown on the Research Events table. If they have no skill level the usual unskilled penalty applies and the likely outcome bad.

Research Events

Investigate Check Effect	Result
–6 or worse	False conclusions are drawn and data is patchy at best. DM-4 applies to all tasks using it.
–4 to –5	The research results seem reasonably comprehensive and reliable but contain serious omissions and errors. DM-2 applies to all situations using this data and an Incident occurs.
–3 to –1	Partial information is available but inaccurate in places or has serious gaps. DM-2 applies to all situations using this data.
0	Sufficient information is available but is vague or patchy and contains a number of inaccuracies. DM-1 applies to all situations using this data.
1–3	Sufficient information is available and reasonably reliable. There are no special effects.
3–5	The research produces solid, reliable results which exceed expectations. DM+2 applies to all situations using this data.
6 or better	The research produces good, solid data that exceeds expectations and has unexpected benefits. DM+2 applies to all situations using this data. In addition, an unexpected Opportunity is spotted.

CHAPTER ELEVEN

WORLDS & ECOSYSTEMS

During their voyage, the Travellers will encounter a wide variety of creatures on a great many worlds. Unlike Charted Space, where many species have been transplanted and can be encountered over a wide area, in regions where there is little, starfaring ecosystems tend to remain pure. This allows some species to survive, which might otherwise have been displaced by imported creatures, and highly unusual ecosystems can develop but it also means otherwise promising worlds to have little or no life.

There is an additional problem for the Referee, in that the creatures of each ecosystem will be unique. It is not feasible to re-use the same creature, as the Travellers will start to wonder how it got from one world to another. Indeed, this would be an interesting mystery for them to ponder. Transplanted species must have a plausible rationale.

When coming up with new creatures the Referee should remain mindful of parallel evolution. That is to say, ecological niches tend to be the same in most areas. A top predator from one world will more than likely be of the same size and capabilities as that from another unless there are big differences between habitats. It is thus permissible to use the same general characteristics for a creature occupying that ecological niche and give the latest one feathers instead of fur or vestigial wings instead of forelegs. A good description of a creature will make it seem quite different from one with similar capabilities, especially if it behaves differently or is encountered in a different environment.

Similarly, worlds tend to fall into certain categories that indicate general characteristics. It is often possible to use the same description of a planet and add a few details to make it unique; one airless rockball is very much like another. The Referee need not expend huge effort on making yet-another-iceball-world feel different from the last few the Travellers landed on. It tends to be life-bearing worlds that have the most variety.

The following general descriptions can be used for worlds encountered by the Travellers, suitably embellished as necessary.

NAMING CREATURES

It can be surprisingly difficult to come up with sensible names for creatures. This is one reason why science fiction is littered with rather lame names created by putting the name of a planet in front of a Terran animal. It is not unreasonable to use a comparative and a descriptive component to create something like the Karnosian Snow-Bear but it is generally better to come up with a unique name if possible.

That can be a burden for the Referee if many creatures have to be developed but there is an easy answer. Most species are named by the scientists who discover them, so why not let the Travellers come up with names for the animals they discover? This might be gratifying to them, knowing that databases will one day be filled with names they assigned or even species named after them. If the Travellers come up with something lame, they cannot blame the Referee…

Planetoid

Planetoids can be encountered solo or in clumps or belts. They have too little gravity to retain an atmosphere but may have ice or frozen gases in areas that do not receive direct sunlight. Comets have similar characteristics and may be encountered passing through the inner system on a highly elliptical orbit.

There is little chance of encountering life on a planetoid or comet, so any threats the Travellers face will be environmental. Jagged rocks can tear a vacc suit and clumps of frozen gas can sublime if heated – even a well-insulated vacc suit boot can transfer just enough heat to cause a clump of frozen material to rapidly become gaseous again. This can have an effect similar to a land mine, although it is rarely so severe. In a planetoid clump there will also be small pieces of rock and debris floating about that can present a hazard.

Planetoids rarely have enough gravity to keep Travellers on the surface. Anyone who does not

anchor themselves and moves incautiously may end up floating away. Even with lines and anchors this can be hazardous, especially on a rotating planetoid. Operations will be slower if the Travellers are not to be endlessly rescuing hapless crewmates.

Moon

Moons vary in size from large planetoids to super-Earth sized rockballs orbiting a gas giant. The largest can be considered equivalent to planets; the smallest to planetoids. Those in between are typically small rockballs with no atmosphere or water, although they may have ice.

Life is extremely unlikely on a typical airless moon, although a moon large enough to retain atmosphere may have an ecosystem of some sort. Hazards are similar to those connected with planetoids – low gravity conditions, sharp rocks, deep dust-filled depressions and other natural hazards. Gas giant moons sometimes sweep through a ring system, creating a constant bombardment with ice and rock fragments that can endanger Travellers but might also scatter useful materials on the surface.

Moon

Protoplanet

A protoplanet is a body that has begun the process of planetary formation but not completed it. That process may be ongoing or the protoplanet may have failed to develop sufficiently and essentially become a very large planetoid or dwarf planet.

A protoplanet might be unstable, potentially breaking up if subject to sufficient stress or an impact, but more commonly protoplanets are formed bodies with similar characteristics to a true planet. A protoplanet might have an iron core, which could generate a magnetic field – although this might have solidified and ceased to do so. Protoplanets are potentially a good source of heavier minerals and metals, which may be more easily accessible than those buried deep in the crust of a mature planet.

Protoplanet

Rockball

Most planets detected by *Deepnight Revelation* are likely to be 'rockballs'. This informal designation refers to a body large enough to have significant surface gravity but lacking an atmosphere. Many larger moons fall into this category as well as planets encountered throughout a star system.

Rockball worlds are typically of little interest, although one might have a high concentration of useful materials. Life is highly unlikely unless there are pocket-ecospheres such as a cave system where outgassing has created a stable environment. Even then, life will be primitive. Hazards are similar to planetoids and moons, although gravity may be sufficient to allow Travellers and their vehicles to operate normally. Bombardment by meteorites is likely, along with the occasional large impact. With no atmosphere to slow or burn up such projectiles they are hazardous at ground level.

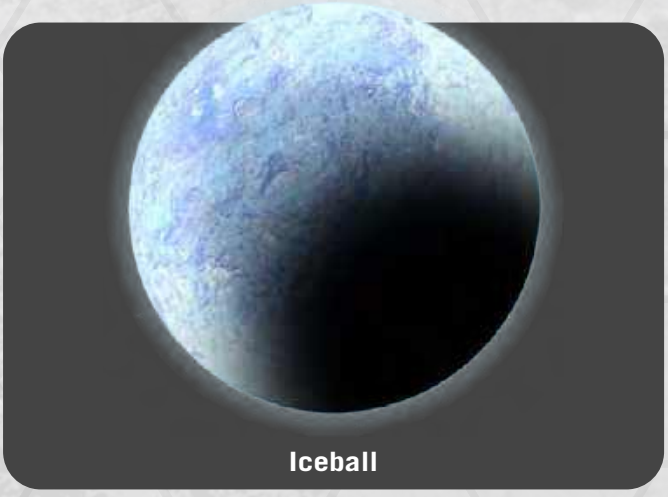
Rockball

Iceball

An iceball world is one that might have had an atmosphere if it was warmer but instead has deposits of frozen gases on its surface. The world may have a trace of atmosphere from materials remaining in a gaseous state but in other ways is similar to a rockball. Iceballs are found in the outer system where there is little stellar heating.

A typical iceball is too cold for life, so hazards encountered by Travellers will be similar to a rockball with the additional dangers of operating in an area where gases may thaw or sublime if heated. Many gases found on iceballs need very low temperatures to remain in a solid state and will turn to liquid or straight into gas if there is a heat source nearby. A vehicle driving over the surface might be constantly surrounded by a pall of subliming gases or an area around a prospective base or mining site may have to be cleared by applying a little heat to expose bedrock.

Some iceballs are in a dynamic state, with heat applied either in some areas by volcanic vents or an external source such as distant starlight or thermal emissions from a gas giant if the iceball orbits one. An iceball may also be heated by gravitational stresses if it orbits a larger body. Dynamic conditions could allow life to develop in warmer areas under the surface of the ice. It is possible for a dynamic iceball to be highly dangerous, with explosions of subliming gas bursting through the ice surface or thin ice covering a liquid area.

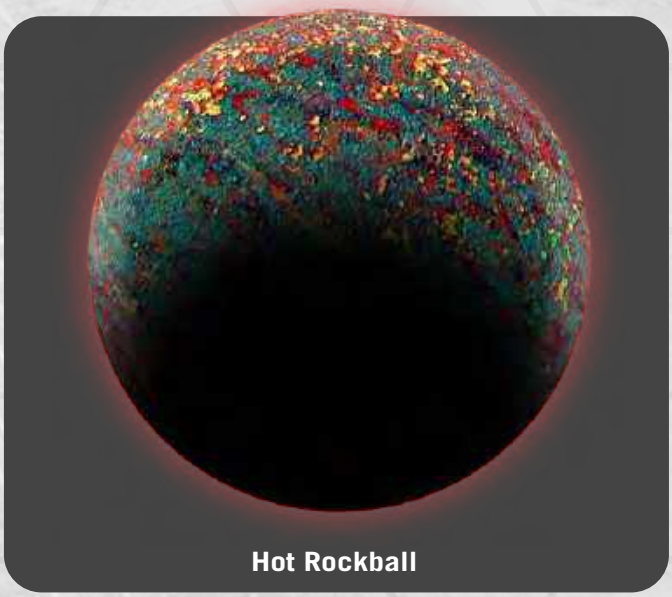


Iceball

Hot Rockball

Hot rockballs are worlds that lack an atmosphere or have only a trace of gas and receive intense stellar heating. They are normally found close to a star, although the category includes worlds with an eccentric orbit that takes them close then far away. Such worlds are subject to intense heating and cooling cycles and often have rapidly changing surface features. More conventional hot rockballs are often tidally locked, with one side facing the star and the other permanently facing away. Such worlds have very different conditions on the ‘bright’ and ‘cold’ faces, with a twilight zone in between, which can be less hostile or subject to the meeting of hot and cold in a manner that makes it extremely dangerous.

Life is virtually impossible on a hot rockball and any atmospheric gas is likely to be burned away. Likewise water or ice is extremely unlikely to remain unless there are deep caverns that do not receive much heating. Hazards are those of the rockball or perhaps iceball on the cold face – if the world is tidally locked – and in addition the bright face receives intense solar radiation. This can be harmful to living creatures and interfere with electronics. In addition, direct heating can create hazards such as pools of liquid metal.

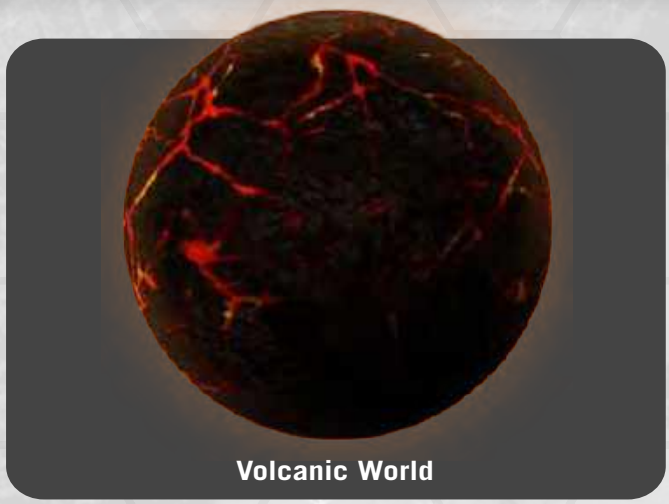


Hot Rockball

Volcanic World

A volcanic world can have any kind of atmosphere or none. It is characterised by high levels of tectonic and seismic activity and active volcanoes. In extreme cases the surface may be partially molten. A volcanic rockball will acquire a temporary atmosphere made up of gases from the interior of the planet, which may or may not become permanent.

Life on such a world is possible if conditions are suitable. Primitive creatures may exist in extremely hostile conditions close to volcanic vents and some volcanic worlds are otherwise habitable and may have developed an ecosphere. This may be threatened by volcanism or rely upon it… or both. Fault lines and other seismic phenomena could make a landing very hazardous but might also give access to buried resources.

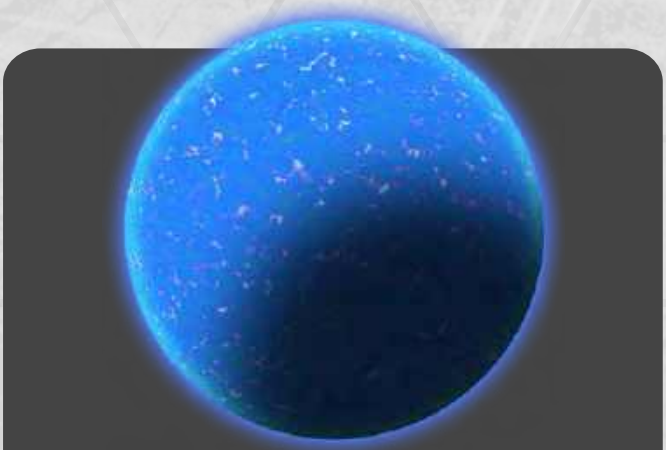


Volcanic World

Water World

A water world is completely, or almost completely, covered in water. It may have a breathable atmosphere but many water worlds have a carbon dioxide-nitrogen gas mix that is unbreathable to humans. An ecosphere is possible if the atmosphere can support one. In many cases this means primitive algae in the oceans, which are putting oxygen into the atmosphere and slowly changing its composition. The Travellers might arrive at a water world at a time when the first complex life is beginning to emerge or find oceans teeming with a vast array of fish and similar creatures.

Water worlds are normally found in the warm zone of a star system but could exist elsewhere if a source of heat is available. This might be tidal, in the form of gravitational stresses, or due to a hot core or radiogenic minerals leaking heat into the depths of an ocean. In that case the surface is likely to be frozen solid and any life present found in the depths. Water worlds present a problem in terms of making a safe landing and can have violent weather patterns as a result of large-scale evaporation and cooling.



Water World

Desert World

Desert worlds have little or no surface water. In theory, a rockball is a desert world but the term is normally reserved for planets with some kind of atmosphere. A desert planet could be rocky, mountainous, dusty, sandy, cold… or any combination of those factors. It is possible to find what amounts to a desert planet that actually has a great deal of water if it is in a frozen state.

A diverse and thriving ecosphere can exist on a desert world. This might take the form of oases or be made up of creatures whose water needs are extremely low, however the food value of plants and animals found on a desert world tends to be low. Hazards include soft sand or dust, which can appear to be solid ground from the air, and wind-blown particles that can get into sensitive machinery. Dust storms can ground grav vehicles and strand personnel, potentially making navigation problematic despite the best sensor equipment available. This is especially true if dust particles have a high metal content or are mildly radioactive.

Desert World

Trace World

Trace worlds have a trace or extremely thin atmosphere, which may or may not be an oxygen-nitrogen mix. Such planets tend to be quite small, without sufficient gravity to retain a thicker atmospheric envelope and not have surface water. If they do, it is usually in the form of ice located in ravines and deep basins. The extremely thin atmosphere means stars are visible even during daytime,and offers little protection from the harsh glare of the system's primary.

Most trace worlds are barren wastelands, with sharp mountains unworn by erosion. Life is uncommon and, if present, would normally be limited to primitive algae,

lichens and the like. Hazards are similar to a rockball in many ways, although a suit breach is less serious as there is at least a little gas pressure outside to slow a leak. It may even be possible to operate without a vacc suit using self-contained breathing gear, although this would be very uncomfortable.

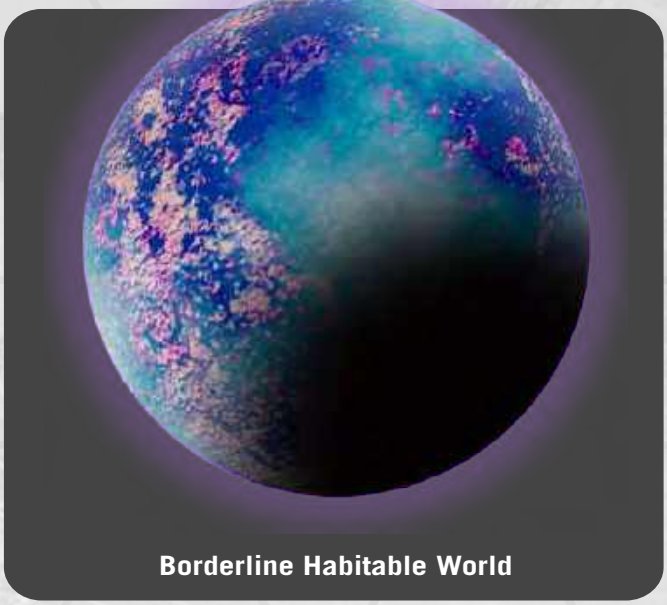
Trace World

Borderline Habitable World

Borderline habitable worlds typically have a tainted or very thin atmosphere, or other limiting conditions such as a lack of surface water. Atmospheric conditions can vary considerably, with some borderline worlds being quite hazardous due to weather and others having none to speak of. Terrain can also vary; worlds with a relatively thick atmosphere will see more erosion and are likely to have rolling hills whereas a very thin atmosphere leaves sharp and jagged mountains. Likewise, water distribution is more even on worlds with a thicker atmosphere, which can create a more consistent ecosphere.

Most will have life of some kind. In many cases this will be primitive but worlds with enough air may teem with life. The nature of this depends on local conditions; a taint normally produces creatures very different from the norm. An alternative form of borderline habitable world has high surface gravity or radiation. Surface gravity is unlikely to exceed 2gs unless the world is formed of unusually dense material and high radiation will make life impossible. However, within these limits borderline habitable worlds are likely to produce some of the most interesting ecosystems the Travellers will encounter.

A borderline habitable world may have intelligent life, although creatures may be adapted for an environment that makes them incompatible with conditions aboard *Deepnight Revelation.* It is possible that a world has become borderline habitable as the result of its inhabitants' activities. Finding a mid-tech race fighting a losing battle against pollution or climate change might present the Travellers with some difficult choices.



Borderline Habitable World

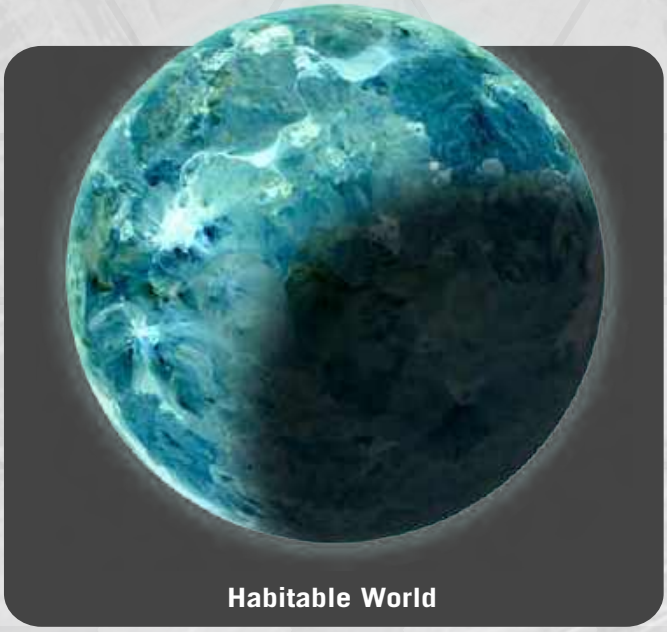
Habitable World

Habitable worlds have a thin, standard or dense atmosphere and enough water to support life. Habitable worlds are usually green and blue, when viewed from space, and look inviting – although an apparently grim world could turn out to be entirely habitable. A world covered by brown and grey fungal growth could still be habitable by humans and support a fascinating ecosystem. Habitable worlds are among the best prospects for gathering resources.

Hazards include the possibility of hostile creatures and the fact that lush vegetation might make finding a safe place to land difficult. What seems to be a grassy plain from a kilometre up might turn out to be a marsh or could conceal soft or broken ground. It might even be the tops of tree-like growths rather than the ground itself. Careful attention to instruments can alleviate some of these hazards but a weary crew looking forward to groundside liberty may be in too much of a hurry to take due care.

Habitable worlds are the best prospects for intelligent life, although this does not mean a civilisation is currently present. The life span of a planet is lengthy and it is entirely possible a civilisation might have arisen thousands of years ago, only to fall back to barbarism. The world's sentient life might even be extinct, replaced by a new set of creatures after some great extinction or

ecological disaster. The Travellers may thus find ruins or indications of civilisation, such as evidence of mining and cultivation, but no sign of those who created them.



Habitable World

Paradise World

Paradise worlds are just right for humans and similar sophonts, with the correct gravity, atmosphere and water, along with other welcoming conditions such as mild weather and an agreeable ecosphere. Such worlds are very rare and represent an excellent opportunity to stop and rest. Indeed, one hidden danger of such worlds is their attractiveness. The crew might not want to leave just yet… or perhaps ever. It may be difficult to persuade the crew to go back aboard *Deepnight Revelation*, or there may be disputes about who has to remain shipside. A paradise world could become a deathtrap if some of the crew sneak planetside when they are supposed to be on sensor watch or otherwise looking after the ship.

A paradise world is no more or less likely to produce intelligent life than a habitable world but should be a rich source of food and similar resources. There is also the possibility that something found on the world could be truly special. A herb that makes medicinal tea might still be lifting morale years after the Travellers have moved on, or delicacies brought aboard might be included in a celebratory dinner. A visit to a paradise world should be memorable even if nothing untoward happens. Indeed, that might be the most noteworthy thing about the planet – for once, nothing tried to kill the Travellers. If they have seen what the Deepnight Entity can do to a life-bearing planet they may find new reasons to destroy it, just to protect the unspoiled wilderness of such places.

Paradise World

Biological Hell World

Biological hell worlds may resemble any other type of planet with life. In rare cases they may look like a barren world or one sparsely populated with living things, concealing their threat behind a façade of normality. A biological hell world is highly dangerous and inimical to explorers, although this may be on a large or small scale. Some hell worlds are characterised by diseases or airborne parasites; others have lethal creatures or plant life that will trap and consume the Travellers.

A biological hell is one of the more likely candidates for rare biologicals but extraction will only be possible after a period of exploration or research, which might be very dangerous. The most insidious biological hells seem innocuous until it is too late, with crewmembers carrying disease, parasites or inimical life forms back to the ship. By comparison, a hell world populated by rampaging monsters is a minor problem for a well-equipped landing party, although there are still many ways to get into trouble.

Biological Hell World

Corrosive Hell World

A corrosive hell world will usually advertise its nature with unpleasant colours and clouds of swirling vapour. This is not always the case, especially where the atmosphere is very thin or non-existent. In such cases the only warning signs are likely to be discolouration around the edges of bodies of liquid. Life is unlikely, and anything that does live there will be very alien – and certainly not edible.

A corrosive hell is a potential source of rare materials, although extraction may pose a problem. Hazards include clouds of corrosive vapour and pools of liquid but even solid materials may be so thoroughly impregnated that they start eating their way through cargo containers after being brought aboard. The nature of a corrosive hell is such that Travellers may forget about other hazards. It is still possible to fall off a cliff or suffer a vehicular accident in such an environment and any incident will be exacerbated by local conditions.

Corrosive Hell World

Icebound World

An icebound world will usually be obvious as such, differing from an iceball in that the atmosphere is not frozen. It could have any type of atmosphere from very thin to dense and must have sufficient water to create a covering of ice. Icebound worlds may be temporary, such as a planet enduring an ice age, nuclear winter, or permanently frozen. The latter normally occurs with planets at the outer edge of the warm zone or where a star has cooled. An ice age world may have examples of its former ecosystem frozen under glaciers or small areas that remain habitable.

Icebound worlds present a unique set of challenges for the Travellers. Landing sites can be treacherous and using any kind of ground vehicle is risky. High winds are not uncommon, often accompanied by heavy snowfall or ice storms, which can endanger grav craft and even pinnaces. Poor visibility and extreme cold make any sort of groundside operations more difficult and there is always the possibility that what seems like solid ground is actually an ice shelf over water – which may be prone to crevasses or sudden collapse. The Travellers might even find that one of their landing parties has floated away on an iceberg.

Icebound World

Super-Earth

A super-earth has a mass significantly greater than that of Terra, typically in the range of 3-10 times. This may be due to an unusual composition, although most super-earths are simply very large. Surface gravity is high, usually leading to a very dense atmosphere that is unlikely to be breathable. It is common to find super-earths shrouded in thick clouds, although super-earth rockballs are also possible.

Life on a super-earth is likely to be small and hardy, if it exists at all. High gravity is the main hazard to Travellers but a super-earth can exhibit other dangers as well. Super-earth water worlds, or highly volcanic super-earths, are also possible.

Supper-Earth

Gas Dwarf

A gas dwarf has a rocky core surrounded by a thick atmosphere, much like a gas giant. The core may be large enough to be considered a super-earth; there is a fine line between a super-earth with a thick methane atmosphere and a gas dwarf with a large rocky core; the Travellers can define them either way.

Atmospheric pressure at the surface of the core is likely to be very high but possibly survivable for a well-equipped craft. It may even be possible to explore at ground level, although this environment is very hazardous. Life, if it exists, will be exotic and unique to the environment. The Travellers will not find food at a gas dwarf, although they may be able to harvest rare biological materials.

Gas Dwarf

Binary Planet

A binary planet is actually two large bodies orbiting about a common point. Complex systems with more than two are theoretically possible but highly unlikely to occur naturally. The two may be of equivalent mass or one body may be much larger than the other. The Earth-Luna system is an example of the latter type. A super-earth orbited by a smaller but still large-planet sized body is another possibility.

Conditions on the two bodies of a binary planet can be very different; indeed, it is common for one to be a rockball or similarly barren body whilst the other may have an ecosystem. Tides will be considerable if there is liquid water and gravitational heating is possible. One or both bodies may be in the process of breaking up under gravitational stresses or the binary planet may yet to have fully settled. For example, a binary planet can be formed by a powerful impact on a planetary body, ejecting matter that becomes a huge moon, or a large moon might be in the process of spiralling inward. The chances of the Travellers arriving at exactly the right time to witness a world being obliterated by its own moon are low, but anything is possible in an expansive cosmos.

Binary Planet

Captured Body

A captured body may have settled into a stable orbit in its new system or may be in the process of doing so. In most cases it will have been travelling through interstellar space for millions of years, although occasionally a body may be perturbed out of its orbit and settle elsewhere in the same system. In either case it is improbable that any life would survive the process. Captured bodies are unlikely to have received many asteroid impacts in deep space but could have been bombarded very heavily in the new system.

Captured bodies can be of any size and may retain some of the characteristics they originally had. A world with an atmosphere might retain it in the form of an iceball, perhaps thawing in its new system. It is even possible that a captured body might show signs of having once been a lush, green world before being ejected from its previous system. However, it is more likely that gas giant moons or outer system planets would be ejected, and these tend to be rockballs to start with. A captured gas giant might have brought its moons with it and would not necessarily retain them in the new system. This might result in the newly arrived gas giant stealing moons from another giant, losing some of its own and/or causing mayhem among long-established orbits. It might be that the Travellers arrive in a system whose orbital dynamics make no sense until it is determined that there is a newcomer whose arrival has cause disruption, which has not yet settled down.

Captured Body

Exotic World

An exotic world lies outside the normal categories. This might be due to outside influences; an otherwise normal terrestrial planet whose eccentric orbit takes it close to the system's primary then out into the far outsystem may have characteristics not normally seen but easily explained. A rapidly rotating iceball whose frozen atmosphere sublimes back to gas as sunlight touches it would have a constant wavefront of gas hurtling around the surface and a freeze-zone following as daylight fades. Strange as this phenomenon is, it is nothing more than physics at work. Other exotic worlds are harder to account for.

Examples of exotic worlds include unusually dense or light planets and worlds with an enormous amount of water, creating oceans of immense depth and tremendous pressures at the seabed. A world that has lost a significant amount of its mass, blasted off by an impact on the far side, might be a very curious shape and prone to wobbles in its rotation as a result. Few exotic worlds will be anomalous in the sense of being inexplicable to modern science but the Travellers will find them at least interesting and in some cases very strange indeed.

Exotic World

Gas Giant

The typical gas giant is familiar to Travellers. It may or may not have a rocky or metallic core and has a deep atmosphere. The majority of gas giants have generally similar characteristics, although size can vary considerably. Some gas giant atmospheres are known to harbour life and it is possible that creatures may live in the depths or even on the surface of a rocky core.

Some gas giants have extensive ring systems composed of rock and ice, and/or a collection of large and small moons. Tidal heating caused by gravitational stresses can potentially warm a moon sufficiently that life may develop, although this is likely to be simple and primitive. Many gas giants are highly radioactive or have exceptionally turbulent atmospheres. It is not possible to determine whether this is the case when scanning for giant planets from a distant star system, so the Travellers may have to brave the dangers or look for another source of fuel.

Superjovians are, correctly speaking, any gas giant with a mass greater than Jupiter in the Sol system. However, the term is normally reserved for particularly large gas giants. Superjovians, impressive as they are, are much smaller than brown dwarf sub-stellar objects and brown dwarfs are vastly smaller than true stars. Nonetheless, it is possible that a rogue superjovian might take its moons with it as it transits through the cosmos and provide them with enough warmth to allow primitive life to exist.

Gas Giant

ECOSYSTEMS

A world's ecosystem and biosphere must make some kind of sense. Ultimately, all life is about energy; typically plants obtain energy by photosynthesis, permitting animals to obtain energy by eating them. There are other factors for life than photosynthesis, however. Ionising radiation is a potential source of energy, as is heat. Extremophile species can exist in incredibly hostile conditions on Earth, so it is plausible that space-dwelling creatures or acid-resistant animals might inhabit some of the more extreme environments the Travellers may encounter.

No matter how weird the creature, certain rules must still be obeyed. Simple life is more common than complex life and everything that does not make its own food – for example by way of photosynthesis – must eat something else. An ecosystem will normally have top predators, mid-level predators, prey creatures and plants or an analogue of them, in increasing orders of mass. If the top predator is very large it will need a great deal of food. Numbers are likely to be low as a result.

Most ecosystems are more or less stable, although change over time is almost certain. There will be a balance between the rate of growth of plants and the rate at which herbivores eat them, and between the number of herbivores and number of predators that eat them in turn. This is self-correcting most of the time but an ecosystem can be thrown out of balance by changing climate or natural evolution. It is possible that the Travellers may arrive at a world just as its ecosystem is being thrown into chaos by some new development. This may arouse suspicion that an infection by the Deepnight Entity has taken place, when in fact the processes involved are quite natural.

Other reasons for anomalous ecosystems include mass extinctions. These can occur for many reasons, not all particularly obvious. For example, a slight warming of the oceans might cause a population explosion in a form of algae that outcompetes other species in the same ecological niche but is not edible to creatures important to the food chain. The collapse of their population deprives many other species of nutrition and causes a mass extinction. Other extinctions are rather more obvious; mass volcanism causes a nuclear winter, killing off the plants that support the rest of the ecosystem.

Overall, ecosystems have to obey the same rules as the rest of the universe. They must make sense and there has to be a reason for anything out of the ordinary. However, that does not mean the Referee cannot push the limits of what is plausible. *Traveller* is, after all, science fiction set in an enormous universe. There is room for much wonder and a little outright weirdness so long as there is plenty of mundane and rational to make the unusual stand out.

CHAPTER TWELVE

ALIEN CONTACT

The Deepnight Revelation expedition has no hard-and-fast rules in place for how interactions with sentient beings are to be handled, other than a need to preserve the safety and security of the ship, and avoid giving strategically important information to potentially hostile races. Standard guidelines are available – straight out of the Imperial Interstellar Scout Service manual – for how to handle contact situations and why giving a developing race access to advanced technology is usually a bad idea. However, given the importance and difficulty of the expedition it may be that the Travellers need to play fast and loose with the rules in order to continue their voyage.

Interactions with the local wildlife may be a bit more straightforward, although it is not always possible to be sure where the line between smart animals and sentient people should be drawn. For example, the Travellers might happen across a world inhabited by large, harmless herbivores and assume they are unintelligent grazers until a psionic crewmember suddenly finds her mind filled by an epic poem about the slaughter of so many brothers and sisters at the hands of the newcomers. A species without appendages to build a technological civilisation could still develop a culture of the mind.

More commonly, evidence of sentience or at least a high level of intelligence is available. Tool use alone is not sufficient to indicate sentience, nor is the ability to make tools a certain guide. The Travellers might spend many frustrating days trying to establish communication with a clever species of animal, based on the assumption that sharpening a stick with a stone to make a spear indicates full consciousness.

Sentience is most clearly indicated by the ability to communicate complex or abstract ideas, and by concern for eventualities the individual has not previously encountered. Animals know when winter is closing in; people can teach their children how to make warm clothing ready for a winter that has not yet begun. Sentience is best established by observation of a species; if they communicate meaningfully with one another and pass along solutions to problems, this is a strong indication of sentience. Abstract thought and complex planning are also good indicators. Of course, in many cases it will be apparent that a species is sentient from the way they live – a well laid out city is a clear indicator that the builders are not merely clever animals.

CONTACT PROCEDURES

The Travellers are not bound by any specific contact procedures. The expedition's planners recommended an attempt at peaceful contact, if contact were deemed desirable, but there is no mandate to contact races discovered. Unless the Travellers want something from a race they encounter, they are under no obligation to do more than make notes about what they have observed and move on.

In fact, the Travellers are not specifically prohibited from exploiting or otherwise harming aliens they meet. There is an assumption they will not engage in cruelty for its own sake but given the nature of the mission certain expedients would be acceptable. The Travellers will presume they will have to someday account for their actions but if they give the matter much thought they will realise they could get away with a lot in the name of maintaining the mission aim and ultimately destroying the Deepnight Entity.

This far from Charted Space, aboard a powerful and well-armed starship, the Travellers are not really accountable to anyone but themselves. The crew might not accept mistreatment of an alien race but conversely it is possible that some members of the crew will actually want to exploit those they encounter. This might be for personal gain or in the name of the mission. Like everything else on the voyage, the Travellers will have to decide how best to proceed and then live with the consequences of their decisions.

INTERACTING WITH ALIENS

The Imperial Credit has no value this far from Charted Space. If the Travellers want to trade with aliens, they have three kinds of valuables: what they can do for the aliens, what they can give to the aliens and what they can teach the aliens. The converse is also true.

Teaching aliens might raise questions. There are no rules about non-interference but handing over the secrets of fusion power and gravity manipulation might disrupt the aliens' society to an excessive degree. On the other hand, aliens who witness the power and sophistication of a TL15 heavy cruiser will want to learn its secrets. The Travellers may have to deal with attempts to steal their ship or coerce them into handing over information. At the very least an alien race will want something valuable in return for whatever the Travellers need, be it information on the systems ahead, use of a dockyard or just a quantity of food.

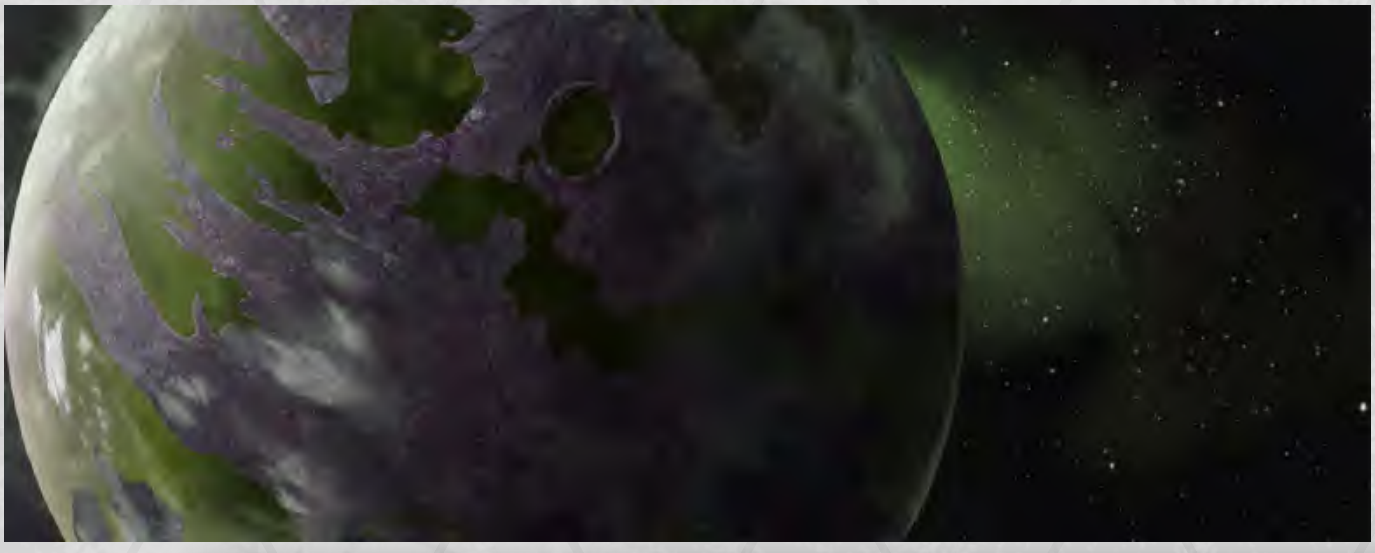
The outlook of an alien race will determine whether they are willing to respect the Travellers' ownership of their vessel. Just as the Travellers may feel the importance of their mission makes hard-nosed choices acceptable, the people they meet may feel just as strongly that the needs of their civilisation outweigh the desires of a bunch of selfish starfarers. An alien race that becomes aware of a powerful ship passing through their territory will want to know if this is the beginning of an invasion and well-meaning Travellers who assure them *Deepnight Revelation* is alone and far from home may unwittingly encourage the locals to try to capture the ship.

Interactions must therefore be undertaken with great care. A balance of respect and concern about the Travellers' capabilities – and the possibility that other ships may be coming – will prevent most races from considering the most violent and direct options. All races will want something from the Travellers, however.

The Travellers may find themselves searching for mineral wealth on behalf of friendly (ish) aliens who are willing to trade them information or services. Alternatively, *Deepnight Revelation* might host peace talks between alien factions or deliver an ultimatum to the capital of a faction opposed to their new friends. The scientists aboard the vessel may be asked to help solve a technical problem, cure a disease or provide assistance in some other way. There is much the expedition staff can do in return for what they need but all of it will take time and delay the mission's progress.

Interacting with aliens – whether they are fellow starfarers or not – will be a tricky business and may lead to additional adventures. A brute force approach may be the best option or it might create additional problems later; a gentle approach might be seen as weakness. There are no perfect answers to any situation the Travellers might encounter and at some point they may wonder whether the expedition's planners left the big spinal mount on *Deepnight Revelation* so they could use it… or so that they would not have to use the smaller weapons.

It may be that the ability to blast their way through an alien culture's space is the best bargaining chip the Travellers possess. Once local powers realise they cannot afford the cost of attacking *Deepnight Revelation*, negotiations can begin. Alternatively, the Travellers might take an entirely different approach, perhaps launching covert operations to grab what they need and moving swiftly on. So far as the mission is concerned the only wrong answer is one that delays or curtails the voyage. Interacting with aliens is a situation where the Travellers will have to simply make their choices and live with the consequences.



GUIDANCE FOR REFEREES

Deepnight Revelation is a big story. There is far more to it than the beginning and end points. The voyage is not something that has to be resolved in order to get to the finale; it *is* the story. Thus the Referee is well advised to follow the fiction writer's adage: *show don't tell.*

Many aspects of the campaign are abstracted or glossed over where they are not relevant but it is important the Travellers remember they are forging a path through uncharted space where any decision can spell disaster. The only way they will remember this is if the Referee provides frequent reminders. Again, this falls under the heading of *show don't tell*... at least at first.

It is not necessary, nor desirable, to play out every single gas giant refuelling. However, the Travellers need to experience a few so that when they abstract a transit they are aware of what is going on in the background. It is entirely permissible to abstract a large activity after the first time it has been done, unless there is some reason why close focus is needed. The Referee should allow the Travellers to experience the difficulties of obtaining metals from a planetoid the first time and then consider abstracting with a CEI check thereafter. In this way the Travellers continue to have new experiences whilst things they do a lot of times on the voyage do not become repetitive.

The Referee should keep in mind that the command staff of *Deepnight Revelation* are lords of all they survey, with virtually no accountability. Yet at the same time there are consequences for their actions. Crew morale, fatigue and the supply situation can be used to channel the Travellers' activities in the right direction; even if the Travellers want to swerve off the expected course and carve out a kingdom somewhere, the rest of the crew may not be so inclined. They signed up to do a job and most want to see it through. Exactly who is disaffected, homesick or even mutinous depends on circumstances.

The voyage should not be permitted to become nothing more than a cycle of CEI checks. The rules in this book are intended to allow an epic undertaking like the *Deepnight Revelation* expedition to be fairly resolved but they should never take precedence over the Referee's ability to tell a compelling story. If the rules throw up a repetitive event, the Referee should substitute something more interesting. If the Travellers meet with disaster as a result of their bad decisions, the rules allow for desperate measures or creative use of exotic materials to come up with a solution.

Overall, the Referee's attitude to the rules should be based on the way the Travellers are playing. If they are telling a good and plausible story, the Referee can use a narrative approach to many situations or use the rules 'softly' to resolve events. If the Travellers are exploitative or insist on claiming they are capable of functioning as iron-willed perfectionists for years on end, the Referee should use the rules without mercy.

Ultimately, the Travellers should reach their goal. If they fail to do so due to their own stupidity, so be it but *Deepnight Revelation* should not fall due to bad luck. There is a way out of almost any situation and if it costs lives or reduces the ship's capabilities, so be it – that is part of the story. A crew that reaches Terminus Point with their ship in tatters will have a better story to tell than one that breezed through on carefully optimised skill checks... and in the end, it is the story that matters.

There is no big cash payout at the end of the campaign; no gain in power or prestige. The Travellers will make their final choices far from home and it is possible (likely) that nobody will ever know what happened to them. The Referee's task is to make the choice meaningful by ensuring the Travellers experience the challenges of the journey and remember what is at stake if they fail.

This book contains rules for adjudicating events along the way but it is the Referee and Travellers who will bring it to life. Use the rules as a framework; give the Travellers problems to solve and let the rules help decide what the consequences of their solutions are to be. The payoff at the end of the campaign is that the Travellers have had an adventure and made memories. These rules should be used to facilitate the making of those memories – hard-won victories, sacrifices and the occasional hilarious stroke of luck.

The Travellers have undertaken a truly epic task. The rules are there to ensure it is tough but fair and that the challenge is great enough that the Travellers will look back on the campaign with a sense of achievement. Use of the rules should always be in that light: Give the Travellers an adventure worthy of the name.

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